National Library of Canada
Bibliothèque nationale du Canada

Canadian Theses Service
Service des thèses canadiennes

Ottawa, Canada
K1A 0N4

NOTICE

The quality of this microform is heavily dependent upon the quality of the original thesis submitted for microfilming. Every effort has been made to ensure the highest quality of reproduction possible.

If pages are missing, contact the university which granted the degree.

Some pages may have indistinct print especially if the original pages were typed with a poor typewriter ribbon or if the university sent us an inferior photocopy.

Reproduction in full or in part of this microform is governed by the Canadian Copyright Act, R.S.C. 1970, c. C-30, and subsequent amendments.

AVIS

La qualité de cette microforme dépend grandement de la qualité de la thèse soumise au microfilmage. Nous avons tout fait pour assurer une qualité supérieure de reproduction.

S'il manque des pages, veuillez communiquer avec l'université qui a conféré le grade.

La qualité d'impression de certaines pages peut laisser à désirer, surtout si les pages originales ont été dactylographiées à l'aide d'un ruban usé ou si l'université nous a fait parvenir une photocopie de qualité inférieure.

La reproduction, même partielle, de cette microforme est soumise à la Loi canadienne sur le droit d'auteur, SRC 1970, c. C-30, et ses amendements subséquents.

NL-339 (r. 88/04) c

Canada

IMAGERY PROCEDURES UTILIZED BY VISUALLY IMPAIRED ATHLETES FOR THE SPORT OF GOAL BALL

BY

MONIQUE BOULAY

DEPARTMENT OF KINANTHROPOLOGY

UNIVERSITY OF OTTAWA

A THESIS

PRESENTED TO THE UNIVERSITY OF OTTAWA

IN FULFILMENT OF THE THESIS REQUIREMENT FOR THE DEGREE OF

MASTER OF SCIENCE

IN

KINANTHROPOLOGY

© Monique Boulay, Ottawa, Canada, 1990

National Library of Canada
Bibliothèque nationale du Canada

Canadian Theses Service
Service des thèses canadiennes

Ottawa, Canada
K1A 0N4

The author has granted an irrevocable non-exclusive licence allowing the National Library of Canada to reproduce, loan, distribute or sell copies of his/her thesis by any means and in any form or format, making this thesis available to interested persons.

The author retains ownership of the copyright in his/her thesis. Neither the thesis nor substantial extracts from it may be printed or otherwise reproduced without his/her permission.

L'auteur a accordé une licence irrévocable et non exclusive permettant à la Bibliothèque nationale du Canada de reproduire, prêter, distribuer ou vendre des copies de sa thèse de quelque manière et sous quelque forme que ce soit pour mettre des exemplaires de cette thèse à la disposition des personnes intéressées.

L'auteur conserve la propriété du droit d'auteur qui protège sa thèse. Ni la thèse ni des extraits substantiels de celle-ci ne doivent être imprimés ou autrement reproduits sans son autorisation.

ISBN 0-315-68032-6

Canada

UNIVERSITÉ D'OTTAWA
UNIVERSITY OF OTTAWA

ABSTRACT

The purpose of this study was to investigate imagery procedures used by visually impaired athletes prior to and during competition. Individual in-depth interviews were conducted with 15 visually impaired goal ball players, competing at a national level. The results indicate that regardless of the degree of visual impairment, these athletes used imagery on a daily basis for functioning effectively within their handicap. Due to their lack of vision, a great deal of feeling and sound was incorporated into their imagery. Suggestions are made for the enhancement of "feeling oriented imagery" with sighted persons.

ACKNOWLEDGEMENT

I sincerely thank all the athletes who consented to an interview. Their cooperation and interest made this study possible.

I would also like to thank my advisor. His guidance was very much appreciated.

Also thanks are extended to Dr. Gord Hope for his help and support in the development of the interview guide, as well as for providing me with the necessary information concerning goal ball.

TABLE OF CONTENTS

INTRODUCTION

In the past decade there has been a significant growth in competitive sport competition for blind individuals. Visually impaired athletes are now given the opportunity to compete at national and international levels, in such sports as goal ball, track and field, swimming, powerlifting, wrestling, gymnastics, and alpine skiing (Sherrill et al., 1986). Due to these numerous opportunities, there exists a need to develop appropriate training and preparation techniques to improve the quality, experience and performance of athletes taking part in these events (Mastro et al., 1985, Ogilivie, 1985). Most often, the goal of the athlete, both abled and disabled is to reach peak efficiency. In order to achieve this goal, many hours are spent preparing technically and physically for a specific sport. However, there is still room for developing specific strategies to enhance the psychological dimensions of their performance (Surgent, 1985).

Mental imagery is one aspect of mental preparation that has received much attention in recent sport psychology literature (Orlick & Partington, 1988; Vealey, 1986; Vedelli, 1985). All senses, for example, visual, auditory, olfactory, taste, tactile and kinesthetic senses, may be involved in creating or recreating an experience in the mind (Vealey, 1986). Athletes at the highest performance level have been found to be highly proficient at kinesthetic or "feeling" imagery, while less skilled performers engage primarily in visually oriented imagery with less feel (Orlick & Partington, 1988). Very little is known about how people learn and become proficient at "feeling imagery".

To date, no research has been done on the type of imagery utilized by blind or visually impaired athletes. Because these athletes are without seeing vision, it is expected that they draw upon other senses. By exploring their imagery processes it is hoped that some light will be shed on how they experience non-visual imagery, how proficient they are, and how they learn to draw upon the senses they use.

REVIEW OF LITERATURE

Due to the lack of substantial research directly related to the research topic, the review of literature has been divided into four main associated areas; the first section deals with imagery, the second section with the visually impaired's orientation and mobility, the third with the visually impaired athlete, and the fourth section with the sport of goal ball.

I Imagery

Imagery is a common technique utilized by coaches, athletes and sport psychology consultants for the enhancement of performance. Through imagery one can create as well as recreate experiences in the mind, by putting together pieces of the internal picture in different ways. In well-developed imagery, one does not simply see the image, one experiences a feeling through the images (Orlick, 1986, Orlick, 1980; Vealey, 1986).

Two types of imagery have been investigated with athletes, internal and external imagery (Orlick, 1986; Surgent, 1985; Vealey, 1986). In internal imagery the rehearser sees, feels and senses him or herself actively involved in what he or she is visualizing. External imagery, on the other hand, involves the person seeing himself or herself performing, as if on television, dissociating him or herself from his or her being.

All athletes possess the ability to experience imagery. However, like any physical or technical skill, the psychological skill of imagery also requires practice in order to be effective (Orlick, 1986, Surgent, 1985; Vedelli, 1985). According to Orlick (1986), imagery can be directed to a variety of objectives: to see success, to motivate, to perfect skills, to familiarize, to set the stage for performance, and to refocus.

Mental imagery provides individuals with an opportunity to see, hear, feel, and think themselves through situations in a constructive manner. By doing so,

they report feeling better prepared to deal with various situations. In their minds, they will have been there many times before (Butt, 1987, Orlick, 1980).

II Visually Impaired's Orientation and Mobility

The terms orientation and mobility have been used to describe the visually impaired individual's proficiency in enabling him/her to achieve safe, efficient and graceful movement through the environment (Loverfeld, 1973). According to Carroll (1961), in order to understand the complexity of restoring lost mobility, it may be helpful to review what the visually impaired person needs to perceive in order to walk with ease. He/she must perceive his/her present position, a final destination, or at least something in the direction in which it lies, within reach, as well as the immediate goal to be reached by the next step (Carroll, 1961).

Obstacles along the route which may be underfoot, over which the visually impaired individual may trip or fall, must also be noticed. The path itself must be perceived as well as the changes in it's horizontal or vertical sense, steps down or up, drop-offs, sudden or gradual changes in grade, and whether the footing ahead is safe or slippery. The visually impaired individual must also be aware of the possible mobile obstacles which he or she may encounter at some point during his/her route (Carroll, 1961).

In order to achieve purposeful mobility, the visually impaired person needs to be effectively "oriented". According to Lowenfeld (1973), the term orientation is defined as a process in which the remaining senses are used in establishing one's position and relationship to important objects in the environment.

The actual locomotion of the individual from one location to another is referred to as "mobility". Mobility then contains all of the skills involved in locomotion (Lowenfeld, 1973). The visually impaired individual acquires the process of orientation through the use of their auditory, tactual, kinesthetic

and olfactory senses, as well as through visualization by those who were previously sighted for some time, before losing their vision.

III Visually Impaired Athletes

It is common practice to overprotect blind individuals by excusing them from vigorous exercise (Buell, 1986). However, according to Buell (1986), physiologically there is no valid reason why visually impaired persons should not compete in athletic events at interscholastic, intercollegiate, national, and even international levels.

Although numerous blind individuals indicate that athletics and physical fitness is an important part of their lives, overprotection still remains as a major problem in the education of visually impaired individuals (Richardson et al., 1987, Sherill et al., 1984).

According to Hanna (1986), the level of physical fitness of visually impaired individuals is significantly lower than that of their sighted peers. Although visually impaired students have recently been mainstreamed in school subject areas, effective participation in physical education is an area in which many problems still exist. A common problem is the visually impaired individual's reluctance to exercise to avoid embarrassment, his/her difficulty in overcoming the protective shell built around him/her by overprotective parents or others, and in some cases the knowledge and attitude of the physical educator regarding visually impaired individuals.

Recent research (Buel, 1986, Nixon II, 1988,Sherril et al., 1984; Sherrill et al., 1986) suggests that blind athletes competing in high level, national and international sport competition do not perceive their parents as the principal source of inspiration for their sports involvement. More important sources include teachers/coaches, friends and self.

According to Buell (1986), more visually impaired athletes are successfully competing in the mainstream against opponents with normal vision. Sports in

which visually impaired athletes are actively competing include swimming, wrestling, gymnastics, skating, tandem cycling, climbing, sky-diving, track and field, powerlifting and cross country skiing (Benison, 1983, Buell, 1981, Buell, 1986).

Because of the number of barriers which still exist today, blind athletes competing in high level competition are very few. It is hoped that in the future, with the education of the public (Ogilivie, 1985), that all blind individuals will acquire the right to compete in mainstream sports of their own choosing.

IV Goal Ball

Goal ball was developed shortly after World War II in various European countries to serve an enormous number of amputees, spinal paralyzed and blind veterans requiring rehabilitation. Today, all visually impaired individuals, young and old, male and female can participate.

In its simplest form, goal ball is played on an indoor court the surface size of a volley ball court. Opposing teams, consisting of three players each, are located in each team area at each end of the court. In order to score, one team rolls a thick hollow rubber ball containing bells across the court, past the three opposing players, and across the endline (Malpass, 1980; McMahon, 1986; Newsletter, 1984). All participants are required to wear blind folds. Tape on the courts edges helps the players to orient themselves.

The players have 15 seconds to put the ball into play by throwing it with a bowling motion. The defending players attempt to block the ball with any part of their body, by flopping down upon the team area (Newsletter, 1984).

Goal ball encourages the use of one's strength, stamina and auditory tracking skills, while providing the visually impaired with an opportunity to compete in a team sport, thus giving them the sensation of what it is like to be "part of a group" (Kearney & Copeland, 1979, McMahon, 1986).

Since its development in 1946, goal ball has grown into an international sport, and is now a part of the Olympics for the Physically Disabled and World Championships.

STATEMENT OF THE PROBLEM

The purpose of this study was to explore how visually impaired national level athletes mentally prepared themselves for competition, specifically with respect to the use of imagery, to determine the type of imagery utilized, the quality of their imagery, and the process by which they have learned and refined their imagery skills. It is hoped that sighted and nonsighted athletes may benefit from this knowledge in enhancing the quality of their non-visual imagery.

RESEARCH METHODS

This section discusses the methodology followed in this study, beginning with an overview of the project design, followed by the method, which contains Subject Selection, Instruments, Design, Procedure and Data Analysis.

Overview of the Project Design

This study was exploratory in nature. It attempted to examine the imagery procedures employed by visually impaired athletes for sport and for mobility outside of sport. Extensive interviews were conducted with elite Canadian blind athletes competing in the sport of goal ball at a national level, to determine the type of imagery they used, the quality of the imagery, and the process by which they have learned and refined their imagery skills.

METHOD

Subject Selection

Subjects participating in this study consisted of 15 top Canadian male and female visually impaired athletes, who were currently competing at a national level in the sport of goal ball, and who had been visually impaired for a minimum of four years.

Instruments

For the purpose of this study, a visually Impaired Athlete Interview Guide was developed to elicit qualitative information concerning each athlete's preparation procedures for competition and for general mobility, specifically with regard to imagery. This open-ended, in-depth interview schedule consisted of a series of questions which investigated the following: visually impaired athletes background concerning the use of imagery and mental preparation for events, the specific feelings experienced by these athletes when using imagery, the distinct senses involved when playing and imagining themselves playing the

sport of goal ball, as well as their views on learning and improving the "feeling" component of imagery. To familiarize the researcher with the process of interviewing visually impaired athletes, as well as to establish face validity with respect to the interview, a pilot study was conducted with three blind goal ball players currently competing. All interviews were taped in their entirety, and later transcribed.

Design

The interview format was considered most appropriate for meeting the needs of this study for the following reasons:

"1. Interviews provide the opportunity for open searching and probing necessary to explore new topics.

2. Interviews enable the investigators to learn and understand the terms which athletes use to discuss mental preparation topics.

3. Interviews scheduled at the convenience of the athletes increase the likelihood that they will participate in the study (Orlick & Partington, 1986, p.4)."

According to Dalen (1973), numerous individuals are more willing to communicate verbally than in writing and data is provided more easily and promptly in an interview than on a questionnaire, especially with special populations of people. The interview also has the advantage of being a flexible measurement device comprised of open-ended questions to which the individuals can offer a relatively free response (Wiersma, 1985). This is especially true for people who are blind.

The flexibility of the interview process allows the interviewer or interviewee to ask for an elaboration or a redefinition of an incomplete or ambiguous response. Open-ended responses may reveal factors or feelings that would not be touched on in a questionnaire. Tone of voice, facial and bodily

expressions conveyed throughout an interview may also provide the interviewer with knowledge that would not be available in a questionnaire (Dalen, 1973; Wiersma, 1985).

Procedure

Prior to the "National Goal Ball Tournament", the researcher met with the tournament organizer and explained the purpose and significance of the study. The tournament organizer then met with the coaches of all competing teams, outlined the study and requested their cooperation. Confidentiality of athlete responses was ensured. An average of two visually impaired athletes per team were selected for inclusion in the study. They were contacted by the researcher and all agreed to be interviewed. Seven players were interviewed at the tournament, and eight in their homes following the tournament. All interviews followed the Visually Impaired Athlete Interview Guide which ensured that questions were dealt with in a standard way. Interviews were then transcribed verbatim. Complete interview transcripts were returned to a selected group of athletes for their review, to ensure the accuracy of content. Each athlete receiving his/her transcript confirmed that what had been recorded and transcribed accurately reflected their comments, opinions and views.

Data Analysis

All interviews were tape-recorded and then transcribed in their entirety. The transcripts were read and re-read, question by question, to draw out response patterns, specific representative quotes, and percentages, where appropriate. Selected interview transcripts were independently read by a second researcher to establish confirmatory evidence with respect to patterns of response.

RESULTS

Demographic Information

All 15 subjects, 13 male and 2 female ranged in age from 18 to 45 with an average of 27.7 years, and a standard deviation of 7.84. With respect to visual impairment, five subjects had been blind from birth, five had been blind for a minimum of four years or more, and the remaining five subjects were legally blind adults possessing less than 20/200 vision. Percentages of vision ranged between 3 to 10%.

Forty-seven percent of the subjects had participated in sports since early childhood, thirty-three percent had participated for the last five to ten years. Fifty-three percent indicated that other people in their lives encouraged them to get involved in sport, while forty-seven percent indicated that others were indifferent.

Forty-six percent of the subjects had been playing goal ball between 1 to 5 years, twenty-six percent had been playing between 6 to 10 years, and twenty-six percent had been playing for 11 years or more.

Forty percent of the subjects got involved in goal ball through schools or rehabilitation centers, twenty-six percent through another player. Another twenty percent began participating in the sport of goal ball when it was introduced to Canada at the National Track and Field Championships in Edmonton in 1977, and a final fourteen percent through the Canadian National Institute for the Blind (C.N.I.B.).

For fifty-three percent of the subjects, goal ball was their favorite sport. Twenty-seven percent said goal ball was a favorite participatory sport, but they also enjoyed playing other sports. Twenty-seven percent said that goal ball was not their favorite sport. Other favorite sports included track and field events, swimming, running, golf, bowling, cross country, skiing, downhill skiing, beep baseball, wrestling and hockey.

General Imagery Orientation

Subjects were asked if they ever imagined themselves doing or accomplishing things in their mind without actually doing it. All subjects reported having imagined things in their minds without actually doing it. When asked in what sorts of circumstances, 33% mentioned using it only for sport (i.e., imagining themselves throwing or blocking a goal ball, skiing, playing hockey, etc.). Another 53% indicated using it for just about any activity involved in day to day living, from preparing mentally for upcoming events, such as interviews, work or writing exams, to recalling tender moments once shared with loved ones. Imagery was also reported being used for carrying out daily routines involving necessary transitions from one place to another such as walking to school and taking the bus to work. By engaging in this type of imagery, these individuals reported feeling more in control of what lay ahead. Another 14% reported that they enjoyed imagining "what can never be", for example activities that they cannot do because of their disability, such as riding a bicycle, flying an airplane or sailing a boat.

Subjects were also asked to participate in some imagery exercises, and then respond to some specific questions relating to the quality and orientation of the imagery they had just experienced. Their qualitative and quantitative responses have been grouped based upon extent and history of blindness. Group one was comprised of five individuals who had been blind from birth or from infancy and did not remember seeing, group two was comprised of five individuals who were previously sighted for some time before losing their vision, and group three consisted of five individuals possessing small percentages of vision ranging between 3 to 10%.

Subjects in all three groups were asked to take a moment to imagine themselves going from home to someplace of their choice. In their imagery 46% went to work, 20% went to school or university, 15% went for a walk, 13% went to a friend's house and 6% went to the gymnasium.

Visual Imagery - When asked, "what did you see", all Group 1 subjects (i.e. those reported never seeing, or not remembering seeing) said they saw nothing when visualizing. They saw no visual pictures of anything in their mind. They explained what went through their mind when doing imagery in the following way.

> *"When you are sighted, you can see, and you have contact with your eyes, but when you're blind, you don't. I can't even imagine seeing with my eyes. I don't know what I would do if I had to see with my eyes. It's not a reality for me. A boy in my class was asked "What do you see?. He answered "I see black". So I asked him, "Have you ever seen before?" He said "No", so I asked "How can you see black if you haven't seen before?". He said "Well I was told that I see black". So if you're told that black is black, then that's the way it is. You really can't tell unless you've seen before and you have your real eyes. It's very hard for me to grasp seeing with my eyes. Between the time span when I lost all of my vision and now, I've learned so much. It all has to be audio. There's so much knowledge for example of what a horse looks like, or what this or that looks like, by touching. When you try to think about it, you "see" it that way because you don't know any other way to see it. So when a sighted person sees something, they feel it the way they see it. For us, we "see" it the way we feel it. It's also kind of funny to try and combine what a sighted person sees to match exactly what a blind person feels. It's mind boggling to think about."*

> *"Basically, it's not an image of objects or things, it's more like you're just doing it like walking. It's like a pattern or route and you take it. I don't think it's much of an image of a picture of the different things that you see, or hear. Sometimes, my mind flips to different things, and I can see myself doing them, but it's not like a picture, it's more like knowledge of what happened at this time, and what could happen again. It's not a matter of what you can see being done, it's kind of a mixture of what may happen, and what has happened. Experiences combining to make a different situation."*

"I didn't see anything because usually I don't. If I'm going to see anything at all, it's going to be the sun, and I use that for direction."

"I do have some light perception, and sometimes it's used to my advantage. Simply because I've done a certain task so often, like passing by a parking ramp, or walking alongside a wall, I can picture or sense that wall next to me while I'm walking."

Group 2 (i.e., those previously sighted for some time before losing their vision), had memories of things which they recalled or utilized in order to create new pictures in their mind. Thus, when visualizing, these individuals were able to incorporate sight into their imagery. What they could see when visualizing was for the most part, very clear. On a 10 point rating scale, their ratings ranged from 8 to 10 with an average rating of 8.8.

"For example, when I am playing golf, I'll imagine the ball on the ground, like when I could see it. I'll imagine my club swinging and driving through the ball, knocking it forward and watching it fly."

"I have colors in images but they're not always right, and they're harder than hell to change once you visualize it. I'm really good at imagery, I think, but if I get the wrong one... For example, I work in a building that sits on the north side of a pedestrian mall on campus. But when I first came to campus, I had the building visualized on the south side of the street. If I get turned around there, I actually have to stop, and think, "let me see, this is over here, and that's over there", or I ask somebody. And then, I almost have to plan a route back because the initial visualization was incorrect."

"When I'm walking up the hill and there's apartments on the left, and there's dormitories on the right, I wonder in my mind if they actually look like what I think they look like."

"I still visualize landmarks, poles, bus stops, etc... I see them as I'm going through it in my mind. When I walk into a room, I visualize, it may not be correct, but I get a visual image of everything I figure is in the room and where it is placed. I guess from the memory of seeing things, I form a picture, but I wouldn't say it's correct."

"I do create visual imagery because I used to have a small amount of sight. In my mind, I still tend to develop visual imagery of the things that I have never seen."

Group 3 individuals (i.e. those possessing small percentages of vision), also experienced "seeing" in their imagery. However, those whose vision had been deteriorating since birth, and those who had never experienced seeing at any percentage above 10%, reported visualizing with the same low clarity of vision they actually possess. For example, if an individual possessed 4% vision, he or she visualized themselves within the same 4% vision, and no more. Since these individuals had never seen clearly, they had no concept of what it was like to see clearly, as is indicated by the following quotes:

"You know what it is like when you walk into a bingo hall and everyone is smoking. Everything is cloudy and you can't see very well. Everything seems blurry. Well, that's how I see all the time."

"When I imagine myself, it's very clear, however it's only how I see and what I can see. For example, I don't see anymore and I don't see any less. I imagine myself with the same amount of vision that I possess."

Their "seeing" ratings ranged from 7 to 10, with an average rating of 8.4., Refer to table 1.

TABLE I

SUBJECTS	CLARITY OF VISION	CLARITY OF FEELINGS	CLARITY OF SOUNDS	CLARITY OF VISION	CLARITY OF FEELINGS	CLARITY OF SOUND
Group 1. Subjects blind from birth	Saw no visual pictures	Scores ranged from 6 to 10 with an average rating of 8.5.	Scores ranged from 3 to 10 with an average rating of 6.4.	Reported "seeing" nothing in terms of visual pictures	Scores ranged from 8 to 10 with an average rating of 8.4.	Scores ranged from 0 to 9, with an average rating of 7.4.
Group 2. Subjects blind for a minimum of 4 years or more-	Scores ranged from 8 to 10 with an average rating of 8.8.	Scores ranged from 4 to 9, with an average rating of 6.6.	Scores ranged from 0 to 6, with an average rating of 3.	Ratings ranged from 6 to 10 with an average rating of 8.5.	Scores ranged from 4 to 9, with an average rating of 7.4.	Scores ranged 0 to 10, with an average rating of 4.8.
Group 3. Legally blind adults possessing less than 20/200 vision (3 to 10% vision)	Scores ranged from 7 to 10, with an average rating of 8.4	Scores ranged from 0 to 6 with an average rating of 4	Scores ranged from 0 to 8 with an average rating of 4.	Ratings ranged from 7 to 10, with an average rating of 8.2.	Scores ranged from 3 to 8, with an average rating of 5.6.	Scores ranged from 0 to 8, with an average rating of 5.

* All answers were rated on a scale ranging from 0 to 10.

Feeling Oriented Imagery - After going to their chosen place in imagery, each subject was asked, "what did you feel", followed by, "how clear was the imagined feeling on a scale from 0-10, with 0 indicating no real feeling and 10 feeling just like you were doing it"?

On average, subjects who were totally blind rated the clarity of their imagined "feelings" as 8.5, with a range from 6 to 10. Sixty percent of this group had "feeling" ratings 8 or above. However this group of subjects reported a high element of feeling when describing their imagery. For example:

> *"At one point, I could imagine with my cane - My waving it back and forth. The tip of it going across the bumps on the sidewalk in a familiar place. I could also imagine the feeling of my feet on the pavement, and the feel of the handle of the cane in my hand."*

> *"I could feel a change in the sidewalk or grass when I came up to my driveway. When I came upon a hill, I could feel myself gradually going down."*

Other Group 1 individuals who had been blind from birth or from infancy and did not remember seeing, reported relying heavily on landmarks and cues, in order to familiarize themselves with their environment. Some also stated that once comfortable with their surroundings, movements become more "automatic", and there is little or no consciousness of feeling. For example, when asked about the scenario they had just imagined, the following comments were made:

> *"It's not conscious and it's not unconscious. It's automatic. The only time I ever do it (i.e. imagery) knowingly is when I'm disoriented. But if I'm going to usual places, whether I'm in the middle of a goal ball game, or whether I'm going to work, or wherever it is, it's unconscious."*

> *"I don't think it's sensory. Not if you're thinking touch, smell, feel. It's mental."*

"When I'm walking, I'm remembering that there is a ramp at this corner, there was a couple of steps that I didn't know were there before, or a bank of snow that wasn't there."

"When I'm walking, I'm more likely to rely on permanent types of landmarks like the sidewalk, a curve, or something identified previously. A known landmark."

Of the individuals in the second group, those previously sighted for some time before losing their vision, all reported experiencing their imagery just like they were doing it. Clarity of ratings on "feeling" with imagery ranged from 4 to 9, with an average rating of 6.6.

"I have a lift that comes to pick me up. So I imagine and feel myself opening and closing the door, walking down the steps and getting into the car."

"Kind of a little excitement and a little anticipation as how I'm going to play."

In the final group, comprised of individuals possessing small percentages of vision ranging between 3 to 10%, few reported feeling anything when visualizing. They tended to "see" themselves when doing imagery. Ratings on "feeling" imagery ranged from 0 to 6, with an average rating of 4.

"I could see all that I was doing i.e. taking the bus, transferring buses, etc., until I got to the office. I could picture all the different stages I had to go through until I got to work. But I felt nothing."

"I could see myself going down the stairs to go outside, waiting for the bus at the corner, etc. If I close my eyes I can see the people I encounter in the morning, and I can see myself."

Auditory Imagery - Subjects in all three groups reported hearing sounds within their imagery as is indicated by the following quotes:

> *"I was also imagining the echoes of my footsteps off the buses that were parked."*

> *"I could hear the cars and the people that might be walking, or passing parking lots, the yelling back and forth, the birds in the sky. I pass by a hospital and they have a heli-port. A copter lands and takes off quite often."*

> *"To get my direction or to have a realization as to where I am, instead of looking at buildings or trees, it would be more like I'm remembering hearing things at certain points, that takes into account any spatial awareness. Things like walking by a tree, and hearing that I walked by a tree."*

> *"I always imagine the sounds of the things around me."*

> *"I really didn't hear anything, it was very quiet, like wind blowing through the grass. There was nothing. It was completely calm."*

> *"I heard the cars along the side of me, and in front of me when I came up to a corner."*

The overall ratings on "hearing" imagery ranged from 3 to 9, with an average rating of 4. The content of auditory imagery did not appear to differ among groups, but subjects blind from birth rated the clarity of the sounds at a higher level.

Group 1 individuals "hearing" imagery ratings ranged from 3 to 10, with an average rating of 6.4. Ratings for group two subjects ranged from 0 to 6, with an average rating of 3. Group three subjects ranged between 0 to 8, with an average rating of 4. Refer to table 1.

Goal Ball Imagery

When asked if they had experienced any imagery of playing goal ball, 87% reported having had images of themselves playing goal ball, while 13% said they had not. The times when they reported having imagined themselves playing goal ball included before a game, during a game, during their spare time, and after a game.

Those who had engaged in goal ball imagery were asked to rate the clarity of their images on a scale from 0-10, with 0 indicating no clear image and 10, a crystal clear image. Their overall ratings ranged from 7-10, with an average rating of 8.5. Some representative comments on their goal ball imagery are presented below:

"Yes, I do have images of myself playing goal ball, but my images vary. Sometimes I'm being successful blocking, and sometimes I'm not. However, they are largely positive images. I'm actually tracking the ball, hearing it being released, and tracking it."

"This is a game which requires a great deal of concentration. What I "see" is often brought on by sound i.e. the ball. I "see" the ball, because I believe it's top priority in the game of goal ball."

"I can imagine an entire game before the actual game is about to begin. In the beginning, I tell myself that I'm going to do this or that, and then I "see" myself do it. I also imagine throwing in a certain direction and then I try to imagine the entire game, where the players are on the opposing team for example."

"I imagine myself playing goal ball because I've played it for eight years. I've also come to a conclusion after thinking about it, that because I had sight at one time, although I don't remember seeing, I know in the back of my mind I could see. Somewhere it's probably

helping me now when I play goal ball. I can imagine, therefore I see what's going on."

"When I'm sitting on the sideline, I imagine one team throwing the ball and the other team jumping around trying to stop it."

All subjects were asked to take a moment to imagine themselves performing a specific goal ball skill or play. For this imagery exercise 60% chose to imagine a blocking skill while 40% chose to imagine throwing.

Visual Imagery - When asked what they had seen in their imagery with respect to visual pictures, all Group 1 subjects, those blinded from birth, reported seeing nothing in terms of visual pictures. What they could "see" is explained in the following quotes.

"I'm using the term "see" because that's something that people identify with. It's receiving stimulus and responding to it. Obviously for me it's using all my other senses, as opposed to just using sight, but I'm obviously not using my eyes. So when I say I'm seeing myself, I'm actually thinking of myself in that position, thinking about hearing whatever it is that I would be hearing, and if there is any tactile stimulus. There is if the ball hits me, but if it goes by there isn't, or there kind of is when it hits the floor. I'm seeing myself in the stance, feeling my feet, using my hands to find the line. That's all part of seeing myself to me. It's all an image, but it's the other senses that are providing the image. Or my brain is interpreting the image probably the same way your brain would. It's just that the information is getting there in a different way. It's like having a knowledge of it, without really knowing all the reasons why it's there."

"No I didn't see anything. It's like a reflex of knowledge of where you're supposed to be when the ball is coming. I don't think of who told me or what they tell me, it's just kind of a reflex action.

The ball comes and you're supposed to be that way. I don't hear anything, and I don't see myself doing it. It's just kind of a reflex action."

"I do imagine the point where I want to throw the ball. I want to throw to a specific point, but I don't actually visualize that point. I just sort of aim at it. I just know it's there from playing the game long enough."

Group 2 subjects, individuals sighted for some time before losing their vision, as well as Group 3 subjects, those possessing small percentages of vision, were able to "see" visual images in their goal ball imagery. On a scale from 0-10, the ratings ranged from 6 to 10, with an average rating of 8.3. Group 2 subjects ratings ranged from 6-10, with an average rating of 8.5. Group 3 subjects ratings ranged from 7-10, with an average rating of 8.2. Some representative accounts of visual imagery from subjects in Groups 2 and 3 are outlined below.

"I envisioned throwing the ball against a competitive team. I also envisioned the court on the floor, the hash marks, me holding the ball, me walking back to the back line, lining up, taking my steps, and throwing the ball, and getting a goal. I saw the other guys at the other end of the court miss the ball."

"In my mind, I can picture the ball in my hand, I can picture the lights being on. I can picture the court and the lines. I'm also able, to a point, to imagine the opposition, not as clear."

"In a vague kind of way I picture the court. I picture the goal area as being darker than the floor."

"I could see myself in a half sprouted position, the ball coming into my chest, and my hands out."

"Sometimes during visualizations and dreams, I'm a spectator to my doing it, and other times, I'm the participant. And in a way, during that visualization, I was more a spectator, watching myself do it, rather than reaching for the ball."

Feeling Oriented Imagery - After engaging themselves in goal ball imagery, subjects were asked if they felt like they were actually doing it. They also rated their imagery from 0-10, with 0 indicating no real feeling, and 10 feeling just like they were doing it.

Some "feeling" was experienced by all athletes within this imagery exercise. On average, subjects in Group 1, those blinded from birth, rated the clarity of their imagined "feelings" as 8.4, with a range from 8 to 10. Eighty percent of this group had "feeling" ratings of 8. Group 2 individuals, subjects previously sighted for sometime before losing their sight, rated their "feeling" with imagery on average a 7.4, ranging from 4 to 9. Sixty percent of this group rated themselves a 9. Ratings for Group 3 subjects, athletes possessing some degree of vision, ranged from 3 to 8, with an average rating of 5.6. Refer to table 1.

The fact that all subjects experienced feeling imagery to some extent, may be influenced by extent of blindness as well as by the fact that blindfolds are required for everyone participating in the sport of goal ball. Therefore every individual has to experience what it "feels" like to execute the skills required for playing goal ball without sight. This may facilitate recall of the actual feeling experienced while doing the skill.

Some representative descriptions of what they imagined in this goal ball imagery exercise are outlined below.

"I first line myself up at the goal line. I throw left handed, so I've got the ball in my left hand, balancing it with my right. I then take four or five steps and throw the ball. As I'm doing so, I'm depending to a certain degree on where I want to place the ball,

dipping my shoulder or pulling it up. I also try to push the shoulder and body into it to get a little more momentum behind it."

"I imagined the feeling on my hands and knee pads on the mat."

"You're told what to do, and think about what has to be correct for people who are seeing it. It's a really hard thing to picture. If you can see, you can see exactly what you're doing, but when you're blind, you can't. You have to go verbally on what has to be done. It's just a matter of combining all that I know and what I'm supposed to do".

"For shooting, ..., if the shot comes off properly and say that I get a goal, then it clicks that I did it right. I try to think back to how it felt when I did it right. If I didn't do it right, I think about why it wasn't the same. Maybe I twisted too much. Sometimes you feel like you're doing something, but you're doing something else, or it'll look like you're doing something else".

Auditory Imagery - Subjects were asked if they heard anything while engaging themselves in goal ball imagery. The clarity of the sounds heard were also rated on a scale from 0-10. It was found that 66% of the subjects engaged in auditory imagery. Their ratings ranged from 4 to 10, with an average rating of 7.4. The final 34% reported no conscious awareness of sound in their imagery. The ratings for Group 1, subjects blinded from birth, ranged from 0-9, with an average rating of 5. Group 2 subjects, individuals previously sighted for some time before losing their sight, rated their "sound" with imagery on average a 4.8, ranging from 0 to 10. Ratings of Group 3 subjects, athletes possessing some degree of vision, ranged from 0 to 8, with an average rating of 5. This may be explained by the fact that regardless of the various degrees of blindness, each individual develops and uses this sense as much as they feel it is helpful or necessary for them. Examples of the content of imagery which did and did not include sound are outlined below.

Imagery with Sound. *"I started off in the stance getting ready to dive for the ball. I imagined hearing the ball... I imagined the ball being carried on the other team's court, and I imagined it being released just left of center. I'm just imagining hearing it roll. It was a smooth release. I didn't bounce at all."*

"I could hear the sounds of the spectators screaming when I made a goal."

"I experience the sounds of the person on the other team getting ready to throw. I hear his foot hit the ground or something that indicates release, either an acceleration of the ball and any piece of the sounds of the bells in it."

"I heard two whistles after the goal, they were pretty loud."

"The ball was moving in my hands, therefore I heard the bells."

"I heard the bells and the echoes in the gym."

"I could hear the ball slightly and I could hear the bells. It was smooth and actually quite fast."

"No Sound" Imagery. *"I wasn't thinking of the ball coming, which is why if you ask me, I didn't hear it."*

"I heard nothing. I visualized a static image of myself waiting in position, completely concentrated."

"This time I heard nothing. Everything was quiet."

Emotion in Imagery - Seventy three percent of the subjects in this study indicated that they experienced emotional feelings when doing their imagery, while the remaining 27% stated they did not. Of the athletes who experienced

emotions, 64% reported feeling nervous, 27% anxious and the final 9% aggressive. The following quotes explain in greater detail the feelings experienced by various athletes during their imagery.

"I can imagine being somewhat anxious, because there's a certain amount of guessing to whether you've got the ball properly lined up or not."

"I'm concentrating on throwing the ball and making sure I don't get a penalty. So the anxiousness and nervousness are not there during throwing."

"I'm very aggressive when I throw. I have to be in order to throw hard. I also felt a bit nevous because I never know what is going to happen."

"In my body I'm a bit tense as I try to focus in on the opposing team getting ready to throw."

"The longer it takes for the ball to be released, the more nervous I get. I get nervous to a certain extent, and then I stop. When the ball is released, I try to wait long enough to track it, and to decide where it's going to be."

"I had a real good feeling as though I was getting the goal and winning the game. It's a big accomplishment."

"When actually performing that same skill my eyes always squint because of the fear of being hit with the ball. So I always kind of cringe to the fact of being hit with the ball. And then when I do get hit, it's not so bad. So your mind overreacts to what is going to happen. Also getting to where I'm supposed to be because I'm a defense person."

Focus During Performance - When asked what they experienced in their mind and body when actually performing that same "imagined" skill in the real situation, their responses were varied and individual, regardless of extent or duration of blindness. Most of the subjects focused on the task, on listening and reacting, or on anticipating being hit with the ball, as is indicated by the following representative quotes:

> *Task Focus. "It's the same as visualizing plus there's a lot of mental energy that's exerted. I want to throw it cross court, I want to hit the gap, and I need this goal, so I've got to exert all the energy that I can on the throw."*

> *"I'm in my stance waiting for the release, finding my position. I'm trying to listen to what they're doing. I listen to the referees. I just try to get a whole image of what's happening on the court, from all the players perspective. Listening to see if anyone is saying anything to each other, paying attention to my team and what the players are saying to me. When the ball is released, I try to wait a second or two, if possible, to track it. So I'm going down and my body is straightening out, because it's going to my right. I'm concentrating on my arms first so I'm getting them far enough apart to block the ball, and hands in the proper position. I'm also concentrating on my legs and my lower torso, trying to get them in position properly, just in case I'm wrong as to where the ball is going."*

> *"I'm concentrating very seriously on where I want to throw the ball, running forward and throwing it. I then take my steps back and listen to what is going to happen. I either get disappointed or happy."*

"The harder I throw, the more I am satisfied with myself. My goal is to hurt somewhat the opposing player. I know that sounds sadistic, but it's the same principle as a boxer, if you don't hurt him first, he will hurt you. You have to take control."

"There is very little emotion when I'm playing. It's just mechanical."

"Basically, all that I do is formulate a picture of the court and where the ball is coming from. I can judge how far the sideline is, so I know how far to go."

Listen and React. *"Once I believe that I've successfully focused in on where the shot is coming from, I then try to make my mind go blank so that I'm not anticipating anything, but relying only on my reflexes."*

"When you're ready and waiting for the ball, you first hear it, and listen to determine where the ball started from. And then as the ball gets about to the middle of the court, I can pick up precisely the direction of the ball, and play accordingly. It's more or less a reflex. You then try to put yourself in the path of the ball so it's going to hit you."

Anticipate Hit. *"Mentally I ask myself if I haven't broken anything. Physically when the ball is coming, you straighten out trying to place your feet properly in order to block it. If the ball is headed for your stomach you have to try and protect yourself. If it is coming for your head try not to have your mouth face with the ball."*

"When I am in a static position, it's like I'm on a chopping block, like I've been sentenced to death. In this sense time stands still while I wait for the ball. The best way for me to prepare myself

is to see this. Each time the opposition throws it's like a sentence to death if I don't stop the ball. I put a great deal of pressure on myself, because it's a stressful situation. Putting this much pressure on myself gives me guts. It's also a question of prestige. To not allow the opposition to score is very prestigious. It's a sign of a very strong team."

For that same "imagined" skill, subjects were asked if they were able to control the imagined experience to make things happen the way they wanted. The amount of control was rated on a scale from 0-10. Regardless of extent or duration of blindness all athletes indicated that they were able to control their images, and expressed no difficulty visualizing a desired experience or outcome. Their ratings ranged from 7 to 10, with an average rating of 8.5.

Mental Preparation

The subjects in this study indicated that they did prepare mentally before competition. Most of it involved imagery or reminders of what they had to do to perform effectively. Some specific examples are presented below:

"About fifteen minutes before a game, I usually listen to music. I use my walkman so I hear nothing but music and it helps me to forget about everything. I close my eyes and I just listen to music. I love music, I find it very stimulating. But when I feel that game time is getting closer, I try to visualize the opposing team. I try to imagine myself throwing. Where am I going to throw, and how hard. When I know exactly where I want to throw, I know that the ball will go where I want it to."

"It depends on the level of competition. If it's international, and I know a bit about the opposing country, I know which players are playing, so I imagine their different moves in my mind. I also try to visualize the various plays that I will make. Where am I going

to throw and in what order, middle, left or right. I can sit down and imagine the first half like I would like it to be."

"I get away from everything, physically, or I just ignore everything else going on. I walk and I imagine the situations that I'll be in. I imagine myself doing the activities, throwing or blocking. Sometimes, I control them, and sometimes I don't. On purpose I decide not to, because if I control them, I find the ball goes where I want it to, and in defense you can't count on that. So sometimes I try not to control where the ball goes, but try to control my movements to it."

"Mentally, just a lot of discussion among the players as to what's going to be happening. I imagine blocking the ball to some extent, but not to a great extent."

"If I'm close to competition, I usually let my visualizations go and excite me and get me jumping."

"About two minutes before a game I sit quietly and close my mind to everything that's around. I think about the first shot, because that's the worst. I think about not allowing my equipment, like my blindfold to bother me. If it's an important game I'm pretty nervous so sometimes I pat my dog and talk to him. I just close away from other people. I guess it's a form of getting control of myself."

"Basically what I do is think about what I have to do. I try not thinking about the mental mistakes I've made in the past. I try not thinking about the strong or weak team that we're coming up against, because you treat them the same. No game is a "give me" and no game is a definite loss."

"I'm just reminding myself to relax, stay cool and if we get a goal to stay calm. Because I have a tendency to get hyper and then I give up a goal. I'm also just thinking "play your game like I know I can."

"I just keep an open mind. I don't like to burry myself in a corner and get dead serious about it. I don't want to clutter my mind with just one thing. I don't think that's good. So I just walk around and chat with people and I worry about the game when the time comes."

None of the athletes in this study had been exposed to a specified mental training program where they were taught mental preparation techniques. The strategies they developed were for the most part self discovered, and utilized only before competitions.

The two most common preparitory strategies drawn upon were auditory imagery and review of task focus.

"I try to imagine the sound of the ball being thrown. I also focus specifically on getting prepared for my own shots, like getting prepared and winding up for my own throws. Those are really the two things I seem to do most."

There was some appreciation for the value of developing of skills for mental preparation and mind-body control (e.g. *"I do some relaxation things, not usually associated with goal ball. But I understand the stress reaction enough to know that if I can do these physical things (exercises) right before the game, that I can keep the mental stress away. I try to replace the heart rate from adrenaline with the heart rate from exercise.")*

There was also an expression of openness and interest in a mental training program by some athletes *(e.g. "If something was available (in mental training), it would really help my game.")*

Beginnings In Imagery

When asked when they first started doing imagery, 60% of the subjects reported having done imagery for as long as they could remember, early in childhood. Another 33% recalled beginning imagery when they became involved in sports, and 7% said they began using imagery after the onset of blindness.

The other 80% of Group 1 subjects reported having always done imagery, as is indicated in the following quotes:

"I have always done it. I don't remember not doing it."

"I've done it ever since I was a little girl, because it's such a natural reaction. I go over things in my mind that are going to happen. For example, if I have to do public speaking, I go over it in my mind, and in my mind, I can get people asking questions."

"It started as a kind of effect that I learned to harness into certain directions. I also learned to make fantasies out of it from reading books or watching television, or from whatever information I get a hold of."

Twenty percent of Group 1 subjects (those blinded from birth), reported beginning imagery when commencing sports.

"I guess I first started doing imagery when I started to play, I remember walking in for the first time and I heard this thing going back and forth, and we were told to be quiet. I wondered what this was all about. I didn't imagine it to be anything like it was when I actually got out there on the court. I imagined six guys running around with blindfolds on, and this little thing that sounded like it was on a skate board flying back and forth. I was surprised. It took awhile to get used to with all these lines and all that."

"I probably started doing imagery after I learned the basics of this sport. And I learned them fairly quickly."

When asked if their imagery had changed or improved over time, 80% of Group 1 subjects (blinded from birth), stated that changes had occurred. Explanations as to how or what changed over time, included incorporating more than one sense when doing imagery, and images becoming real as a result of the experiences and knowledge acquired through time. The following quotes are representative of the various changes experienced by these athletes.

"Hearing was the most dominant, but now I've added touch as well, just accepting the ball."

"I learned to make more kinds of fantasies out of imagery, from "reading" books and "watching" television, or from whatever information I got a hold of."

"With 8 years of experience, I've made all the mistakes that can be made."

"When you get older you're more self conscious, so it does change. Rather than taking an approach that isn't serious, you take a more serious one."

Of the individuals in Group 2, those previously sighted for some time before losing their vision, 40% always remember having done imagery, another 40% began doing imagery when playing sports, while the final 20% recall engaging in imagery as a direct result of blindness.

When asked if their imagery had changed over time, 40% of the group 2 subjects reported no change, while 60% spoke of improvements related to incorporating more feeling and more global imagery.

"Now, I think my images are more global, both visual and real."

"My images are all in color, live and real."

"Yes, I guess it improved. Now I feel like I'm more really there."

"I depended more on certain senses than I do now. I would have an image, but because of not being as good at hearing and feeling as I am now, I would double check a lot more. These days I'm now inclined to go with my feelings."

In Group 3, subjects possessing small percentages of vision, 40% always remember visualizing while the remaining 60% did so when they became involved in sports.

"I started visualizing when I was really young because of my lack of vision. I had no choice. I had to notice things, to remember various landmarks. I also had to visualize where I had to go and how."

"I'm always visualizing. Because of the little vision I have left, certain criteria come from my senses. For example, I often get a picture of someone by hearing, whether or not this person has a pleasant voice and by smelling. When I am with this person, my nose tells me if they smell good or not, and that's how I form a picture of that person."

Eighty percent of Group 3 athletes reported no change or improvement in their imagery over time, while 20% felt that their imagery became clearer and more real with time.

"I've been doing this for awhile, so I don't recall any change."

"My imagery improved now I'm able to see a number of things, as well as hear exactly what is going on. For hockey, when my team is warming up for a game, I can see myself on the ice talking to the

guys on my team. I can hear what we are saying. We can do all kinds of things with our imagination."

Group 2 subjects who were previously sighted for some time before losing their vision, as well as Group 3 subjects, those possessing small percentages of vision, were asked to compare the imagery they did when they were sighted to what they did now.

Forty percent of Group 2 subjects reported that their imagery has become more realistic, another 40% felt that their imagery hadn't changed, while the final 20% did not remember doing imagery when sighted.

"It's exactly the same thing. I'm sure of that because I remember I'd prepare for weekend games, and it's exactly the same thing as now."

"When I was sighted, I guess you could say I would do future imagery, like here's what I want do someday, or here's what I want to do on this next play, or here's the next shot I want to hit. Before when I imagined myself doing things, it always had a great result at the end, here's what I'm going to do, and it's going to be perfect. Now when I imagine myself doing things it's just imagining it to know what I'm going to do at a time, without any specific result, even though I would like it to be at my advantage. I try to imagine myself doing something that I want to do in the right way. But before, I just assumed I was going to do all the functions right, and it's only the result I used to imagine."

"My imagery is more realistic now. Before it was not realistic, I would always imagine myself as a winner, and then become very discouraged when I lost."

Eighty percent of Group 3 subjects have possessed the same amount of limited vision all their lives. They have never experienced "seeing" a clear

or perfect picture. These athletes visualize the way they see, (i.e. without clarity). The lack of clarity of their images has remained constant. The other 20% of Group 3 subjects, at one time, could "see" an almost perfect picture, but have gradually become more visually impaired with time. Although these subjects no longer possess the same degree of vision, their images are more complete due to the memories they have. However, recalling certain images has reportedly become more difficult for them as the extent of their vision decreased.

Suggestions for Improving Feel Imagery

All subjects in this study were asked if they had any suggestions about how we might help athletes improve their feeling oriented imagery, whether those athletes are visually impaired or not.

Eighty seven percent had suggestions which they felt may be helpful in developing an athletes feeling oriented imagery or overall performance. These methods are best described in the following quotes.

> *Feel and Describe Feeling: "Just tell them to feel. What you can do if you're working with an athlete is to get him to describe his feelings, and you reflect them back. You could tell him what you're feeling, and see if it's the same thing he's feeling. And if it is, then you've taught him how to feel, because you're having the same ones. You've taught him how to use feeling, and sound. You can teach him to use anything. Try to get people to experience things as if they were involved, as if they could describe the experience to you in a way that allows you to have the same physical and emotional feelings."*

> *"Try to get athletes to convince themselves that they're really there in their imagery by saying "I'm living it" "I'm in the process of playing my game, and I feel all the movements." But that takes time an concentration."*

Immediate Recall. *"As you are practicing, after a certain play or situation, you could ask the player to examine their feelings or think about how the play was articulated, and what actually happened at that particular time. They would recall it better then, than if you asked them later. It's sort of like imprinting."*

Perform Without Vision. *"Subtracting eyesight is obviously a good way to enhance feeling, and doing a lot of tactile things, feeling, complimenting the other senses. Using everything you possibly can (every sense), not just concentrating on hearing or whatever."*

"For athletes who can see, just make them practice their sport blindfolded, in order to give them a better picture. Whether you want to or not, the other senses will come into play to help make up for the ones that they don't have, i.e., your ears and your nose help out your eyes. My hockey coach never skated blindfolded, so he doesn't really know what it's like to be in our shoes. But my alpine skiing coach did, so she knows more about what it's like to be in our situation. I think that is a good method."

Feeling Dimensions

The following quotes explain the importance of obtaining a "feeling" for the environment in which the athlete has to perform, by using the appropriate senses to orientate him to feel right or left, where the goals are located or where the spectators will be seated. In doing so the athlete will visualize more accurately, and therefore have a better feeling of what lays ahead.

"There are obviously a lot of differences in imagery between people who have seen and those who haven't. We need a mechanism for setting up imagery with people who haven't seen to ensure that there aren't any misperceptions, because that's a big problem. That would be somewhat related to establishing a conceptual framework in people, for example what is right and left, what is front and back

and something about body position. If you start with somebody that doesn't know that, in goal ball, you'll get them laying 90º, 45º and half down. The imagery related to this, is how I should fall and it should always be along this line, but you've got to know the concept of parallel before."

"In the beginning stages of the sport they should be shown the court in detail, for example by touching the parameters of the court, the length of the hashmarks, etc., so they get a perception of the court, it's size and dimensions. A lot of people don't have good spatial concepts."

"I know some blind athletes involved that really don't know what they're doing, and it takes a long time and a lot of hard work to get them to understand that the object of the game is to throw the ball as hard as you can. Since the athlete has never had the "feeling" of what it is like to throw hard, this task will be impossible until the athlete has experienced it."

In order to enhance "feeling oriented imagery" blind athletes also felt that it would be profitable to ask the athlete to focus solely on the feelings experienced when performing a specific skill. In other words instead of focusing on visual images, the athlete would attempt to make his mind go blank visually, while focusing solely on the feelings generated from the environment, the equipment utilized, as well as the familiar movements of the body.

CONCLUSIONS AND RECOMMENDATIONS

The interview transcripts suggest that the onset of blindness has a direct effect on how clearly and extensively subjects "feel" during imagery. An individual who has been blind from birth who wishes to function effectively has no alternative but to acquire a highly developed process of orientation through the use of their auditory, tactile, kinesthetic and olfactory senses. Some of

this orientation drew heavily upon the use of "feeling" imagery. "Feeling" for these individuals became their way of "seeing".

In well-developed imagery, one does not simply see the image, one experiences a feeling through the images. These athletes detailed description of the "feeling" component of their imagery were similar to the very vivid and rich experiences of the best athletes in the works of Orlick & Partington (1986).

Clearly these athletes have highly developed imagery with respect to internal imagery in which the rehearser sees, feels and senses themselves actively involved in what they are visualizing (Orlick, 1986).

Subjects who could see at one time but no longer had sight, incorporated visual images into their imagery to a greater extent than "feelings". This suggests that because these individuals have had at one time drawn heavily upon visual images and were not as practiced at "feeling" images, these were the images that were largely incorporated into their imagery.

Without sight as a guide, visually impaired athletes have acquired the appropriate skills needed to perform successfully in the sport of goal ball through touch, feel and sound. By touch or feel they have learned the dimensions of both the court and team boundary areas, the location of the overthrow line and all necessary information required to play goal ball, including the size, speed, and direction of the ball, and where the spectators are seated. Through feel they continuously gain feedback on whether or not a specific skill was well executed. Many athletes reported "feeling it" when the ball was thrown out of bounds as well as when it "felt good", in anticipation of a goal. This "feeling" knowledge is learned over time, and with feedback. Through a great deal of practice, subjects learn to rely heavily on "feel", partially as a result of tuning into their own actions and partly due to the information provided to them by a seeing coach, on what is performed correctly, or incorrectly.

The sounds of opposing players preparing to throw and the movement sound of the ball, allows players to position themselves properly. Spectators, as well as team players are asked to remain quiet throughout play. Effective defensive athletes developed excellent auditory sensing skills. It is through touch, feel and sound that visually impaired athletes acquired the knowledge necessary to participate successfully in the sport of goal ball.

Recommendations for Enhancing Imagery

The following recommendations for improving "feeling oriented imagery" are based on the findings in this study.

1. Encourage athletes to describe the feelings experienced during real and imagined performances in enough detail for other athletes to understand or to "feel" as though he or she had lived the same experience.

2. Encourage athletes to practice focusing on different senses (e.g., touch, feel, sound), during performances and while engaged in imagery.

3. In practice, after executing a specific skill, encourage athletes to recall their "feelings". While the skill is still fresh in their mind, athletes can mentally re-experience the skill that was just performed incorporating feeling.

4. Allow athletes to perform skills blindfolded or with eyes closed in order to compliment or focus more fully on other senses.

5. To get a better feeling of the environment in which athletes have to perform, he may be able to draw upon touch or "feel" to examine the dimensions and surroundings of the environment.

6. Encourage athletes to make his/her mind go blank visually, while focusing on the familiar movements of the body or feelings generated from the environment.

At the conclusion of these interviews, many athletes expressed a keen interest in what had transpired during the interview, and openly requested more input in the mental training area. Many athletes were surprised to discover that specific mental training techniques existed to enhance performance. A number of coaches also expressed interest and requested additional information concerning the various mental readying techniques, as well as where to obtain further information. Sport psychology services were said to be lacking in the area of handicapped sport, even for those competing at the national and international level. Mental training would be a valued addition to ongoing programs in this area and rich with opportunities both for contribution to and learning from special populations of people.

Further studies which explore blind athletes involvement in sport are needed to help fully understand the developmental aspects of various mental skills, commitment, and learning, as well as adaptation and coping mechanisms utilized by these individuals. By engaging in this type of work the quality services that are lacking today, may become more available in the future, to help blind athletes be the best that they can be in sport and life.

BIBLIOGRAPHY

1. Andre, C.J., & Means, R.J. (1986). Rate of Imagery in Mental Practice: An Experimental Investigation. Journal of Sport Psychology, 8, 124-128.

2. Benison, S. (1983). Gymnastics For The Blind - The State of The Art. TAHPERD Journal, 52(1), pp.10-62.

3. Bennett, G.J., & Pravitz, E.J. (1987). Profile Of A Winner. Bets Ltd., Itcha, N.Y., pp.287-307.

4. Buell, C. (1981). Blind Athletes Compete in the Mainstream. Visual Impairment and Blindness, 75(9), pp.379-380.

5. Butt, S.D. (1987). Psychology Of Sport. Van Nostrand Reinhold Company. New York., pp.185-187.

6. Carroll, J.t. (1961). Blindness. Little Brown and Company., Toronto., pp.134-177.

7. Chapman, K.E.(1978). Visually Handicapped Children and Young People. Routledge & Kegan Paul, London., pp.56-113.

8. Dye, L. (1980). Competitive Athletics For The Blind. IRUC Briefings, 6(2), p.4.

9. Guitierrez, E.T. (1983). Goal Ball: An Activity for the Visually Impaired. Journal of the National Intramural Recreational Sports Association, 8(1), pp.25-26;43.

10. Kearney, S., & Copeland, R. (1979). Goal Ball. Journal of Physical Education and Recreation, 50(7), pp.24-26.

11. Kearney, S., & Copeland, R. (1980). Goal Ball. OAHPE Recreation, 13(1), pp.2-4.

12. Lowenfeld, B. (1973). The Visually Handicapped Child In School. The John Day Company, New York., pp.279-290.

13. Malpass, J.J. (1980). USABA National Championships - a Sight to Behold. Journal of the American Optometric Association, 51(7), pp.693-694.

14. Masto, J., French, R., Henschen, K., & Horvat, M. (1985). Use of the State-Trait Anxiety Inventory for Visually Impaired Athletes. Perceptual and Motor Skills, 61, pp. 775-778.

15. Mastro, V.J. (1985). Diamond of the Visually Impaired Athlete. Palaestra, 1(2), pp.43-46.

16. Mastro, V.J., Sherrill, C., Gench, B., & French, R. (1987). Psychological Characteristics of Elite Visually Impaired Athletes: The Iceberg Profile. Journal of Sport Behavior, 10(1), pp.39-46.

17. McGrain, P., Dyke, V.J., & Mastro, J. (1987). Coefficients of Restitution of Balls Used in Team Sports for the Visually Impaired. International Journal of Sport Biomechanics, 3, pp.63-68.

18. McMahon, J.(1986). Goal Ball - A Comparison of Blindfolds. Palaestra, 2(4), pp.8-12.

19. Nixon II, L.H. (1988). Getting Over the Worry Hurdle: Parental Encouragement and the Sports Involvement of Visually Impaired Children and Youths. Adapted Physical Activity Quarterly, 5, pp.29-43.

20. Ogilivie, C.B. (1985). Sports Psychologists and the Disabled Athlete, Palaestra, 1(4), pp.36-43.

21. Orlick, T. (1990). In Pursuit of Excellence. Champaign, Illinois & Leisure Press.

22. Orlick, T. (1986). Psyching for Sport. Champaign, Illinois: Leisure Press., pp.111-114.

23. Orlick, T., & Partington, J. (1988). Mental Links to Excellence. The Sport Psychologist, 2, pp. 105-130.

24. Pick, L.H. (1980). Tactual and Haptic Perception. In Welsh, C.R., & Blasch, B.B. Foundations of Orientation and Mobility. American Foundation for the Blind, New York., pp. 89-115.

25. Richardson, J.M., & Mastro, V.J. (1987). So I Can't See... I Can Play and I Can Learn. Palaestra, 3(2), pp.23-26; 32.

26. RCDNS NEWSLETTER. (1984). Goal Ball Growing in Canada, pp.3-5.

27. Sherrill, C., Rainbolt, W., & Ervin, S. (1984). Attitudes of Blind Persons Toward Physical Education and Recreation. Adapted Physical Activity Quarterly, 1, pp.3-11.

28. Sherrill, C., Pope, C., & Arnhold, R. (1986). Sport Socialization of Blind Athletes: An Exploratory Study. Journal of Visual Impairment and Blindness, 80(5), pp.740-744.

29. Sherrill, C. (1986). Sport Anxiety and Elite Blind Athletes. In Mastro, V.J., & French, R. Sport and Disabled Athletes. Champaign, ILL.,: Human Kinetics Publishers., pp. 203-208.

30. Surgent, C.F. (1985). An approach to Reaching Peak Performance. Women's Coaching Clinic, 8(7), pp.13-36.

31. Vealey, S.R. (1986). Imagery Training for Performance Enhancement. In Williams, M.J. Applied Sport Psychology. Mayfield Publishing Company, Palo Alto, California., pp. 209-232.

32. Vedelli, J. (1985). Mental Rehearsal in Sport. In Bunker et al. Sport Psychology. McNaughton and Gunn Inc., Ann Arbor Michigan., pp.256-261.

33. Wiener, R.W. (1980). Audition. In Welsh, C.R., & Blasch, B.B. Foundations of Orientation and Mobility. American Foundation for the Blind, New York, pp.115-187.

34. Wiersma, W., (1985). Research Methods in Education. Allyn and Bacon Inc., University of Toledo., pp.142-146.

APPENDIX A

INFORMED CONSENT FORM

The purpose of this study is to investigate the imagery procedures utilized by visually impaired athletes for the sport of goal ball.

Each participant is requested to engage in a tape-recorded interview lasting from fifteen to thirty minutes. During this process I hope to gain an understanding of the visually impaired athletes mental preparation for sport competition specifically with regard to imagery.

TO PARTICIPANTS

Your voluntary participation in this study is fully appreciated and respected. If there are any questions you do not wish to answer, you are free to do so. Your are free to withdraw at any time without prejudice.

Your interview material will be kept completely confidential. In presenting the results of the study, identifying information will be changed in order to protect anonymity. Also, the tape recordings will be erased at the completion of the study.

You will receive a copy of the summary of the results of this study. Thank-you for your time and willingness to contribute to this research.

MONIQUE BOULAY

UNIVERSITY OF OTTAWA

(613) 231-2938

TO BE COMPLETED BY PARTICIPANT

The Informed Consent Form has been read to me and I fully understand the purpose and design of this research, and steps taken to protect anonymity. I agree to participate in this study as described.

Signature: _____

Date: _____

Address: _____

_____

APPENDIX B

VISUALLY IMPAIRED ATHLETE INTERVIEW GUIDE

1. What is your name?

2. How old are you?

3. How long have you been visually impaired?

4. How long have you been involved in sports?

5. Did people in your life encourage or discourage you to get involved in sport?

6. How long have you been playing goal ball?

7. How did you get involved in the sport of goal ball?

8. Is goal ball your favorite sport?

9. Do you ever imagine yourself doing or accomplishing things in your mind without actually doing it? If yes, what do you use it for? In what sort of circumstances?

10. Take a moment to imagine yourself going from home to someplace. Where are you going to go? Imagine yourself doing this.

a) What did you feel? How clear was the imagined feeling on a scale from 0-10, with 0 indicating no real feeling and 10 feeling just like your were doing it?

b) What did you hear? How clear were the imagined sounds on a scale from 0-10 with 0 indicating no clarity and 10 hearing very clearly?

c) What did you see? How clear to you was the vision on a scale from 0-10?

I am going to ask you now about the images you have when playing goal ball.

11. Do you have images of yourself playing goal ball?

a) If yes, how often?

b) How clear are your images or feelings? On a scale from 0-10, with 0 indicating no clear image and 10 a crystal clear image, where would you rank yourself?

12. Take a moment to imagine yourself performing a specific goal ball skill or play. What skill or play would you like to do? O.K. try it.

a) Did you feel like you were actually doing it? On a scale from 0-10, with 0 indicating no real feeling and 10 feeling just like you were doing it, where would you rank yourself?

b) What did you hear? On a scale from 0-10, how clear were the sounds?

c) What did you see? On a scale from 0-10, how clear to you was the vision?

13. Did you have any emotional feelings? (i.e. nervous, anxious, etc.)

14. When actually performing that same skill in the real situatin, what do you experience in your mind and body?

15. When you try to imagine yourself doing that same skill, are you able to control the imagined experience to make things happen the way you want? On a scale from 0-10, how much control do you have?

16. How do you prepare mentally for competition? For training? What usually goes through your mind just prior to the game?

17. Do you do any kind of mental training for goal ball? (Probe for details about source of ideas, actual strategies, and mental training practices in terms of when, where, how often, with whom, and with what success).

18. When did you first start doing imagery? At that time was it primarily "feeling" or other senses? Did it change or improve over time?

19. What kind of imagery did you do when you were sighted? How did that compare with when you became visually impaired, or now?

20. Do you have any suggestions about how we might help athletes improve their feeling oriented imagery? (sighted or visually impaired).

21. How do you feel about this interview? Do you have anything you wish to add?

APPENDIX C

TRANSCRIPT 1

What is your name?

This information is kept confidential.

How old are you?

Thirty-four years.

How long have you been visually impaired?

About 33 years.

How long have you been involved in sports?

About twenty to twenty-two years.

How long have you been playing goal ball?

Twelve years.

How did you get involved in the sport of goal ball?

I got involved in goal ball because it was a sport that they first introduced at the Canadian Games for the Physically Disabled, which I attended. It was one of the sports there, and I thought I would try it.

Is goal ball your favorite sport?

I guess to participate in it probably is.

Do you ever imagine yourself doing or accomplishing things in you mind without actually doing it?

Yes, all the time.

In what sort of circumstances?

Everything, from walking to school to sports, to writings exams.

Take a moment to imagine yourself going from home to someplace. Where are you going to go?

I'm going to the university.

Imagine yourself doing this.

O.K. But I could go on for awhile, it's an hour trip. I could probably imagine it for an hour.

What kind of feeling did you get when you imagined yourself going to the university?

At one point I could imagine with my cane. My moving it back and forth. The tip of it going across the bumps on the sidewalk in a familiar place. I was also imagining the echoes of the footsteps off the buses that were parked along Woodridge Crescent out by Bayshore, which I go past on my way to get a bus. I could also imagine the feeling of my feet on the pavement, and the feel of the handle of the cane in my hand.

How clear was the imagined feeling on a scale from 0-10, with 0 indicating no real feeling and 10 feeling just like your were doing it?

I would say 8 or 9.

Did your hear anything?

Actually no I didn't. Not this time. Sometimes I do. Except for the sounds of the echoes, and being aware of the buses.

How clear were those sounds on a scale from 0-10?

About 4 or 5 probably.

Did you see anything?

No.

Do you have images of yourself playing goal ball?

Yes.

How often?

Fairly often. Probably just about every couple of days or almost on a daily basis I suppose.

How clear are your images or feelings?

They're pretty clear.

On a scale from 0-10, with 0 indicating no clear image and 10 a crystal clear image, where would you rank yourself?

I'd say an 8 or 9.

Now take a moment to imagine yourself performing a specific goal ball skill or play. What skill or play would you like to do?

I'm going to defend a shot.

O.K. Try it.

O.K.

Did you feel like you were actually doing it?

Yes.

On a scale from 0-10 with 0 indicating no real feeling and 10 feeling just like you were doing it, where would you rank yourself?

Probably about a 7 or 8.

Did you hear anything?

Yes. The bells and the echoes in the gym.

Again on a scale from 0-10?

Probably about an 8.

Did you have any emotional feelings?

A little nervous.

When actually performing the same skill in the real situation, what do you experience in your mind and body?

I experience the sounds of the person on the other team getting ready to throw. In my body I'm a bit tense as I try to focus in precisely on that. I also try to let my mind go blank so that I'm not anticipating anything. And then as the opponent throws the ball, I hear his foot hit the ground or something that indicates release, either an acceleration of the ball or the sounds of the bells in the ball. At that point I start to move. I prepare, almost like getting myself in a springing position to go to where I think the ball is going to go.

About making your mind go blank. You can get all thoughts and feelings out of your mind?

Yes. Once I've believed that I've successfully focused on where the shot is coming from, I then try to make my mind go blank so that I'm not anticipating anything but relying only on my reflexes.

When you try to imagine yourself doing that same skill, are you able to control the imagined experience to make things happen the way you want?

Yes. Usually I am.

On a scale from 0-10, how much control do you have?

I'd say 8.

How do you prepare mentally for competition?

I usually get away from everything, either physically, or I just ignore everything else that is going on, and I walk. I imagine myself in the situations that I've been in. I also imagine myself doing the activities like throwing or blocking. Sometimes I control them and sometimes I don't. On purpose I decide not to. If I'm right on top of the preparation I could do either at will. If I control the images I find the ball goes where I want it to, and in defense you can't count on that. So sometimes I don't control the whole thing. I try not to control where the ball goes, but once I know in my imagination where it's going, I try to control my movements to it.

So when you say you don't see anything, you get no pictures. So what do you mean by imagining?

I can feel the floor or lanolium, depending on where we are playing, under my feet. I can hear the balls, the echoes in the gym. I can be aware, just as if I was playing. I can be aware of everything, where my teammates are, where the score table is or where the spectators are seated.

Is it all on feeling then?

Yes. Feeling and sound.

Do you have any specific mental training techniques?

Nothing that I've particularly defined. I try to imagine the sound of the ball being thrown. I also focus specifically on getting prepared for my own shots, like getting prepared and winding up for my own throws. Those are really the two things I seem to do most.

What usually goes through your mind just before a game?

I often go over some fundamental rules with myself and how to defend certain shots. I sort of make agreements with myself about things that I'll do, things that I won't let myself do or things that I won't try to get caught up doing that don't work for me, and agree to do the things that do work.

When did you first start doing imagery?

I don't know. I may of always done it. I don't remember not doing it.

When you first started doing imagery was it primarily feeling or other senses? Did it change or improve over time?

Again I'm not sure to the answer to that, but I do know that it hasn't changed in a long time.

Do you have any suggestions about how we might help athletes improve their feeling oriented imagery?

Yes. Tell them to do it. Just tell them to feel. What you can do if you're working with an athlete is to get him to describe his feelings, and you reflect them back. You could tell him what you're feeling, and if he's feeling the same thing you are, then you've taught him to feel because you are having the same ones. You taught me how to use feelings, you taught me how to use sound, you can teach me to use anything. Now we're getting into a technique I want to develop as a sport psychologist. It's experiential. Experiential involvement is trying to get people to experience things as if they were involved, as if they could describe the experience to you in a way that allows you to have the same physical and emotional feelings.

How do you feel about this interview? Do you have anything you wish add?

When I plan to train people to do this, I'm going to get them to drag it out. A dive for example, from the time you start your run up to the time you hit the water, that's how long you should imagine. But unless people are trained to do this they don't do it.

APPENDIX D

TRANSCRIPT 2

What is your full name?

This information is kept confidential

How old are you?

Eighteen.

How long have you been visually impaired?

Fifteen years total I think.

How long have you been involved in sports?

Five years.

Did people in your life encourage or discourage you to get involved in sport?

They didn't either way.

How long have you been playing goal ball?

Just into my fifth year.

How did you get involved in the sport of goal ball?

Through school. I went to a blind school and it was just something that we did. I tried out and I managed to make it on the team.

Is goal ball your favorite sport?

Yes.

Do you play other sports?

Yes. I've done shot put, discus, javelin, running long jump, swimming and running.

Do you ever imagine yourself doing or accomplishing things in you mind without actually doing it?

Yes

In what sort of circumstances?

Just different things. If I was throwing something like in shot put or discus, I would imagine how I should be letting go and if I'm standing in the proper position. Just the way I was taught to do it, and how I would do it.

Take a moment to imagine yourself going from home to someplace. Where are you doing to go?

School.

Imagine yourself doing this.

O.K.

What did you feel?

Well just the usual. No feeling I guess. I'm so used to doing that, that I don't feel anything. It's just kind of a duty everyday.

Can you explain to me your walk. Just tell me what kinds of things you have to do.

I have to walk all the way up my street, to a main street. And actually I jump half way down the street because there are dogs that usually run out and bark.

Do you have a feeling about where the dogs are going to come out?

Sometimes, but it's really hard. You know that they're coming, but you're not ready for it that split second.

When you imagined yourself walking, did certain things come into your mind?

I count the posts on the side when I walk by. It gives me something to do.

When you were imagining yourself going to school, did it feel like you were actually doing it?

No, because even when I'm going to school my mind can be elsewhere, thinking about a seminar that has to be done the next day or something. So every day I might get on a different bus depending on when I get out the door. I guess different little things happen and I get nervous sometimes. If I get on the bus and the driver doesn't answer me or something that makes me nervous. I guess I don't picture myself doing anything, except if there's a seminar or something. I can picture myself standing up in front of the class and making them laugh.

On a scale from 0-10, with 0 indicating no real feeling and 10 feeling just like you were doing it, how clear was the imagined feeling?

About 6

Did you hear anything?

Not really, just the dogs.

How clear were the imagined sounds on a scale from 0-10 with 0 indicating no clarity and 10 hearing very clearly?

Actually not really that clear. It's almost like the mind over matter.

What did you see?

Nothing.

You have no pictures in your mind?

Basically it's not an image of objects or things, it's like a pattern or route and you take it. I don't think it's much of an image of a picture of the different things that you see, or hear. It's because you're used to doing certain things so often, and it's not like a picture, it's more like knowledge of what happened at this time, and what could happen again. It's not a matter of what you can see being done, it's kind of a mixture of what may happen, and what has happened. Experiences combining to make a different situation.

Do you have images of yourself playing goal ball?

No. Actually I don't.

Take a moment to imagine yourself performing a specific goal ball skill or play. What skill or play would you like to do?

Defending.

O.K. Try it

O.K.

Did you feel like you were actually doing it?

Not really.

Can you tell me what was going through your mind when you were imagining yourself defending.

Again it's like what you're told to do, and thinking about what has to be done in order for it to be correct for the people who are seeing it. If you can see then you can see exactly what you're doing, but when you're blind you have to go verbally on what has to be done. I don't feel it. It's just a matter of combining all that I know and what I'm supposed to do from being told time and time again.

Do you ever go on feeling? Like the way things feel and that's how you know you're doing it right.

Sometimes, but sometimes it's hard because things change. Things change so often it depends on the circumstances.

Did it ever happen that you went on a familiar feeling?

A couple of times, but I never realize it until later when it becomes successful. For shooting if the shot comes off properly, and say I got a goal, then it clicks into the fact that I did right. I then try to think back to how it felt when I did right. When you don't do it right you also think about it because it wasn't the same, you think of what was done wrong.

But if you did a skill the wrong way you can actually feel why that happened?

Sometimes you feel like you're doing something but you're actually doing something else, or it will look like you are doing something else.

On a scale from 0-10, with 0 indicating no real feeling and 10 feeling just like you were doing it, where sould you rank yourself?

Five or six.

Did you hear anything?

I heard nothing.

Did you see anything?

No. It's like a reflex of knowledge of where you are supposed to be and when the ball is coming. I don't think of who told me what, it's just kind of a reflex action. The ball comes and you're supposed to be that way. I don't hear anything or I don't see myself doing it, like I said before it's just kind of a reflex action.

Did you have any emotional feelings?

No.

When actually performing that same skill in the real situation, what do you experience in your mind and body?

My eyes always squint because of the fear of being hit with the ball, so I always kind of cringe of the fact of being hit with the ball, and when I do get hit it's not as bad. So you're mind kind of overeacts to what is going to happen. I'm also getting to where I'm supposed to be.

When you try to imagine yourself doing that same skill, are you able to control the imagined experience to make things happen the way you want? On a scale from 0-10, how much control do you have?

Actually I had quite a bit of control, about an 8 or 9.

How do you prepare mentally for competition?

I think it's usually about two minutes before a game, I sit quietly and I listen to people around me, but I close my mind to everything that'a around. I think about the first shot because that's the worst. I think about not allowing my equipment, like my blindfold, to bother me. If it's an important game, I get pretty nervous sometimes, so I just pat my dog and talk to him to get away from other people. I guess it's a form of getting control of myself.

Do you do any kind of mental training for goal ball?

Well we've practiced mental strategies but for the other team. Part of our mental strategie is to keep control of the ball, and keep it going down one side of the court so your mind is thinking that it is going down that ne side, it's just mental anticipation.

When did you first start doing imagery?

I've done it since I was a little girl because it's such a natural reaction. As I said I go over things in my mind that are going to happen, like if I have to do public speaking. In my mind I can get people asking questions. In my images I'm alway confident, but when I'm actually there I'm not. I do alot of public speaking on visual impairment, so what I try to do is to decide what kinds of questions people could ask, and how I could make the answer funny so they will laugh in order to break the ice. What happens in my mind is that they will laugh, but in real life they don't know whether to laugh or cry.

When you first started doing imagery at that time was it primarily feeling or other senses? Did it change or improve over time?

Somewhat, because when you're young not as self conscious and when you get older you are. Rather than take an approach that isn't as serious you take a more serious one.

Do you have any suggestions about how we might help athletes improve their feeling oriented imagery?

When you're practicing a movement, you have to do that same movement many times before it becomes natural and you understand the feeling. This takes a long time if you want the movement performed the correct way. Sometimes it feels different each time. I guess it depends on the mobility of the individual and their understanding. When I'm standing on the court I know mentally and from audio where each position is across from me, and how to get the ball there. I also know that when I shoot, if I didn't do it right, it will go out. But there are alot of visual impaired people that don't know that. This is something that is really difficult to accomplish.

How do you feel about this interview? Do you have anything you wish to add?

It depends on the individual as far as mental preparation. Some people are nervous and some people aren't. Myself I prefer people around me but not talking to me, because it interupts my train of thought. Like those two minutes before a game, I might be thinking about this or that, but it's two minutes of myself. When people ask me if I'm ready to play, I am mentally because I've had that time to think about my own thing. If you think of you're own thing then you are at peace with yourself, so you know what you're doing.

(continued conversation)

You can see and you have contact with your eyes, but when you're blind you don't. I can't even imagine seeing with my eyes. I don't know what I would do if I had to see with my eyes, it's not a reality for me. The boy from my class when he's asked "What do you see?", he answers "I see black", and I ask him "Have you seen before?", he said "No". I then asked him "How can you see black

if you haven't seen before?", he said "Well I was told that I see black". You really can't tell unless you've seen before. I've learned so much mentally, it's very hard for me to grasp seeing with my eyes, it all has to be audio. There is so much knowledge about what a horse looks like, or what this or that looks like, by touching I see it that way, because I want to see it that way, because I don't have any other way to see it, so I feel it. A sighted person sees something but they feel it the way they see it, for us we see it the way we feel it. It's kind of funny to try and combine what a sighted person sees to what a blind person feels. It's mind boggling to think about.

APPENDIX E

IMAGERY PROCEDURES UTILIZED BY VISUALLY IMPAIRED ATHLETES FOR THE SPORT OF GOAL BALL

MONIQUE BOULAY

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF SCIENCE

DECEMBER 1988

CHAPTER I

INTRODUCTION

I INTRODUCTION AND IMPORTANCE OF THE STUDY

In the past decade there has been a significant growth in competitive sport competition for blind individuals. Visually impaired athletes are now given the opportunity to compete at national and international levels, in such sports as goal ball, track and field, swimming, powerlifting, wrestling, gymnastics and alpine skiing (Sherrill et al., 1986). Due to these numerous opportunities, there exists a need to develop appropriate training techniques in order to improve the quality experience and performance throughout these competitive events (Mastro et al., 1985; Ogilivie, 1985). Most often, the goal of the athlete, both abled and disabled, is to reach peak efficiency. In order to achieve this goal, many hours are spent both technically and physically preparing for a specific sport. However, besides the physiological readiness required in order to attain peak performance, there exists specific strategies to enhance the psychological dimensions of performance (Surgent, 1985).

Mental imagery is an area of investigation which has received much attention in recent sport psychology literature. It involves using all senses in order to create or recreate an experience in the mind (Vealey, 1986). In sport, the visual, auditory, olfactory, taste, tactile and kinesthetic senses are important in order to simulate as closely as possible the actual situation. It has been discovered that athletes at the highest performance level engage primarily in kinesthetic or "feeling" imagery, while others engage primarily in visually oriented imagery (i.e. as if watching themselves perform on television). Very little is known about how people learn and become proficient at "feeling" imagery.

To date, no research has been done on the type of imagery utilized by blind or visually impaired athletes. Because these athletes are without seeing vision, it is expected that they draw upon other senses. By exploring their

imagery processes it is hoped that some light will be shed on how they experience non-visual imagery, how proficient they are at it, and how they learn to draw upon these senses.

This study proposes to explore how national level athletes, who are visually impaired, mentally prepare for competition specifically with regard to the use of imagery. This will lead to a better understanding of the imagery procedures and mental preparation patterns used by visually impaired athletes. It is also hoped that sighted athletes may benefit from this knowledge in order to enhance their auditory, tactile, olfactory, taste and kinesthetic senses when visualizing. Lastly, this information may be helpful when providing the necessary services to help the visually impaired athlete enhance his or her preparation procedure for competition.

II THE PROBLEM

STATEMENT OF THE PROBLEM

The purpose of this study is to investigate the visually impaired athletes imagery procedures used prior to and during competition. This exploration will attempt to determine the type of imagery utilized by visually impaired athletes, the quality of their imagery, and the process by which they have learned and refined their imagery skills.

III DELIMITATIONS

The subjects in this study are limited to visually impaired athletes who are currently competing at a national level. They are drawn from goal ball teams involved in national competition across Canada, and have been visually impaired for a minimum of fifty percent of their life.

IV DEFINITION OF TERMS

Visual Impairment - Is defined as 20/200 vision or possessing light perception with no acuity and possessing three degrees or less in visual field (Malpass, 1980).

Mainstream - Visually impaired athletes competing in the mainstream are those who have performed in an environment open to both abled and disabled individuals. Such environments no longer segregate visually impaired individuals from participating to their maximum capacity.

CHAPTER II

REVIEW OF THE LITERATURE

Due to the lack of substantial empirical research directly related to the research topic, the review of literature has been divided into four main associated areas; the first section deals with imagery, the second section with the visually impaired's orientation and mobility, the third with the visually impaired athlete, and the fourth section with the sport of goal ball.

I IMAGERY

Imagery is an accepted technique for the enhancement of sport competition, used and taught by coaches, athletes and sports psychologists. According to Orlick (1980), almost everyone, at some time or another has used mental imagery, however usually not in a refined or systematic way. Through imagery we are capable of creating as well as recreating experiences in our mind, by putting together pieces of the internal picture in different ways. We are able to build an image from whatever pieces of memory we choose. In well-developed imagery, one does not simply see the image, one experiences a feeling through the image (Orlick, 1986). Since signt is not the only meaningful sense, one should attempt to enter fully into that image with all senses, especially through the tactile and kinesthetic senses (Orlick, 1986; Orlink, 1980; Vealey, 1986).

Two types of imagery have been investigated with athletes, internal and external imagery. In internal imagery the rehearser sees, feels and senses him or herself actively involved in what he or she is visualizing, as if doing it. External imagery, on the other hand, involves the person seeing him or herself performing, as if on television, dissociating him or herself from his or her being. Research at this time, suggests that internal imagery, involving feeling, is the best means of achieving a more effective performance in sport situaitons (Orlick, 1986; Surgent, 1985; Vealey, 1986).

The following two theories suggest how imagery may enhance performance; the psychoneuromuscular theory as well as the symbolic learning theory.

The psychoneuromuscular theory proposes that when athletes imagine the motions without actually performing them, similar impulses occur in the brain and muscles (Vealey, 1986). Scientific data sustains the notion that realistic, imagined events create innervation in our muscles, similar to that produced by the real situation. Thus similar neural pathways are used to perform imagined and actual movements. Although the muscle activity is far less dramatic during imagery, the fact that it occurs in conjunction with imagined movements is of great significance (Vealey, 1986). It is presumed that through the use of

imagery, certain neural pathways may actually be strengthened (Butt, 1987; Vealey, 1986; Vedelli, 1985).

The symbolic learning theory suggests that human beings possess a blueprint for each movement, as all movements that are made must first be encoded in the central nervous system (Vealey, 1986). Imagery is thought to facilitate performance by helping individuals code their movements into symbolic components, making the motion more familiar (Vealey, 1986; Vedelli, 1985).

All athletes possess the ability to use imagery. However, like any physical or technical skill, the psychological skill of imagery also requires practice in order to be effective. To become skillful at the use of imagery, athletes do it everyday (eg. immediately proceeding, following, or coinciding with performance) (Orlick, 1986; Surgent, 1985; Vedelli, 1985). When doing imagery, it has been found important to use as many senses as possible so that the athlete feels the reality of the image through this symbolic representation (Surgent, 1985). The most effective images are clear, and occur in normal speed.

Numerous top athletes have developed an excellent capacity for clear vivid imagery. According to Orlick (1986), imagery can be directed to a variety of objectives:

1. To See Success - Athletes using imagery can often "see" themselves reaching their goals ie. seeing themselves performing their skills at an optimum level.

2. To Motivate - Calling up past or future competitions as well as images of future goals may be used as one method to increase motivation by vividly reminding one of their objectives.

3. To Perfect Skills - Top athletes "see" and "feel" themselves performing faultless routines or skills on a regular basis.

4. To Familiarize - Imagery can also be used to help the athlete familiarize him or herself with such things as the competition site, a complex play, or different strategies.

5. To Set the Stage for Performance - High level athletes often do a complete mental run through of the key elements of their performance in order to draw out the desired feeling for competiton.

6. To Refocus - Mental imagery can also be beneficial in helping the athlete to refocus when the need arises. For example, recalling a best performance when practice is not going well, may help the athlete to get back on track.

According to Vealey (1986), imagery may also be used for controlling physiological responses by influencing bodily functions such as heart rate, respiration, blood pressure, and skin temperature. An example of why this may be important is sport involves controlling as well as optimizing arousal level prior to competition.

Numerous high level athletes will use mental imagery techniques so that in championshiup contests, they will not be facing totally new and unfamiliar situations. In their minds, they will have been there many times before (Butt, 1987).

Mental imagery provides individuals with an opportunity to see, hear, feel, and think themselves through situations in a constructive manner. By doing so, they report feeling better prepared to deal with various situations (eg. more confident and better prepared) (Orlick, 1980).

Successful imagery involves using all senses. However, sighted athletes rely heavily on vision and many lesser skilled athletes have reported some difficulty in "getting the feel" when visualizing. Becaus eyesight, for most individuals, is the sense the most depended upon throughout life, perhaps the remaining senses, although never intentionally overlooked, do not develop to

their maximum capacity. In an article entitled "An Approach to Reaching Peak Performance", Surgent (1985) suggests the possibility of "Blind Training" for sighted athletes. Such training would involve practicing physical skills blind, in order to promote an increased awareness of the internal mechanisms which guide our movemerts. Blind individuals are continuously using alternate senses in order to accomplish a variety of daily tasks. Because of their disability, visually impaired athletes may be more adept at imagery which involves other senses (eg. feeling, hearing, touching, etc.).

Visually impaired individuals must cope with their blindness every day using various strategies in order to do so. Perhaps mental imagery is one of the strategies they utilize for normal functioning (eg. walking from one place to another). According to Ogilvie (1985), the applicability and modification of mental imagery for the blind athlete raises some immediate questions. How can we teach imagery to the visually impaired athlete? Perhaps a better question is What can blind athletes teach us about imagery?

Once the art of imagery has been mastered by all athletes, both abled as well as disabled, there will be an endless variety of applications in the enhancement of learning and performance (Ogilvie, 1985).

II VISUALLY IMPAIRED'S ORIENTATION AND MOBILITY

The terms orientation and mobility have been used to describe the visually impaired individuals proficiency in enabling him/her to achieve safe, efficient and graceful movement through the environment (Lowenfeld, 1973). According to Carroll (1961), in order to understand the complexity of restoring lost mobility, it may be helpful to review what the visually impaired person needs to perceive in order to walk with ease. He/she must perceive his/her present position, a final destination, or at least something in the direction in which it lies, within reach, as well as the immediate goal to be reached by the next step (Carroll, 1961).

Obstacles along the route which may be underfoot, over which the visually impaired individual may trip or fall, must also be noticed. The path itself must be perceived as well as the changes in it's horizontal or vertical plane, steps down or up, drop-offs, sudden or gradual changes in grade, and whether the footing ahead is safe or slippery.

The visually impaired individual must also be aware of the possible mobile obstacles which he or she may encounter at some point during his/her route (Carroll, 1961).

In order to achieve purposeful mobility, the visually impaired person needs to be effectively "oriented". According to Lowenfeld (1973), the term orientation is defined as a process in which the remaining senses are used in establishing one's position and relationship to important objects in the environment.

The actual locomotion of the individual from one location to another is referred to as "mobility". Mobility then contains all of the skills involved in locomotion (Lowenfeld, 1973).

The visually impaired individual therefore acquires the process of orientation through the use of their auditory, tactual, kinesthetic, olfactory

and gustatory senses, as well as through visualization by those who were previously sighted for some time, before losing their vision.

Because the senses play an important part in orientation and mobility for the visually impaired, they will be discussed further in the following paragraphs.

AUDITION

Hearing is one of man's most important senses, and is considered the "Queen" sense for the blind. Auditon is very important to the visually impaired individual as it may provide information about the environmnent usually received through vision, such as distance and depth (Lowenfeld, 1973). According to Lowenfeld (1973), through persistent efforts to use this sense to its fullest, the visually handicapped person as a result, exhibits greater sensory awareness in hearing. Hearing, also a long distance sense, can inform an individual what is more distant in the environment (Weiner, 1980). The existence of space and the distance through space to a sound emitting object can also be identified by using this sense. Hearing also enables the visually impaired person to grasp certain characteristics of the immediate environment. For example, a blind person entering a room is able to make an estimate of the room size as well as what types of furnishings are present, through the use of reflected sound. However, the acoustical qualities will differ from surrounding to surrounding, depending on what materials the room is constructed from (Lowenfeld, 1973). The sound quality of the room may be further altered due to furnishings, drapes and rugs.

According to Lowenfeld (1973) the visually impaired individual, when seated in a room, may be conscious of any unique sounds. For example, the opening and closing of the door can reveal it's location in relation to him/her, sounds, streaming in open windows may indicate the relationship of the windows and outside wall to him/her, and the sound of a clock may provide another landmark thus helping the individual become oriented to the room. There are also characteristic sounds from the kitchen and workshops, as well as a change

in the sounds of footsteps due to a change in floor surfaces. Any audible sound has the potential of becoming an orientation aid (Lowenfeld, 1973).

The visually handicapped, in interpreting the environment, uses numerous subskills of hearing that are indispensable in effective orientation. These are echolocation, sound localization, selective listening and sound shadow.

ECHOLOCATION

Echolocation is the activity of emitting a sound and perceiving the qualities of the reflected echo (Lowenfeld, 1973). It may take any of the following forms: clicking of the tongue, snapping of the fingers, or even slapping the feet on the floor. Clickers on heels, for example, are often used to acquire additional information from the environment, such as the dimensions of rooms, the presence of objects in the environment, and direction of the hallway (Chapman, 1978).

The activity of echolocation is a huge resource in moving about for the visually impaired, and has, over the years, been referred to as "obstacle perception" which is, according to Lowenfeld (1973), a poor term due to it's negative connotation. Whether an object is an obstacle or an aid depends entirely on the visually impaired person's ability to cope with that object. All objects, with the proper mobility skills, can be adapted and used by the blind person as aids for travel. For example, the discovery of mail boxes, fences, telephone poles, etc., can all become travel aids by indicating specific places along the visually impaired individuals route (Lowenfeld, 1973). Although echolocation can be learned by anyone with normal hearing, in order to develop this ability, practice and opportunities for learning is required.

SOUND LOCALIZATION

Sound localization may further help in orientation by allowing individuals to determine the precise location of a sound source (Weiner, 1980). According to Lowenfeld (1973), with a sound source directly to the right, the sound waves

will reach the right ear with more intensity than they will the left ear, as well as a fraction of a second earlier. Due to the intensity difference and time lapse, sounds coming from the right or left are more easily localized than sounds coming from the front or rear.

Through sound localization, one can determine whether footsteps are coming toward him/her or moving away, as well as in the precise direction. The sound of a closing door may indicate the exact location of doorways, as a radio left turned on will indicate a specific room (Lowenfeld, 1973). When outdoors, by localizing the sounds of cars stopped behind a crosswalk, one can determine his/her position at a street corner. By tracking the sound of moving vehicles, the visually impaired individual can determine whether or not they are in a position parallel to traffic, thus ensuring a safe crossing to the opposite side (Welsh, 1980). Sound localization also enables the visually impaired to face the person to whom he or she is talking to (Lowenfeld, 1973).

SELECTIVE LISTENING

Selective listening is defined as the ability to select one sound out of a cluster of many, all occurring at the same time (Lowenfeld, 1973). This skill is also helpful in orientation ,as the ability to select the appropriate sounds among the many traffic sounds for example, is essential for crossing the street. Another example is that while both carrying on a conversation and walking down a corridor, the visually impaired person may occasionally sample footsteps in order to proceed confidently down the same hallway, once the conversation has ended (Lowenfeld, 1973).

SOUND SHADOW

According to Lowenfeld (1973), the sound shadow is "a region of relative silence behind an object which filters out the sound waves". For example, if a person is standing on a sidewalk next to a truck parked along the curb, the truck will mask the sound waves generated by a passing car. Tree trunks,

telephone poles, vehicles parked along a curb, as well as the corner of buildings may be detected through the use of sound shadowing (Lowenfeld, 1973).

TACTUAL SENSES

Tactile information is also extremely important, as the visually impaired individual acquires much information through the hands and feet, and if properly used, the cane (Lowenfeld, 1973).

According to Lowenfeld (1973), the visually impaired person may obtain a considerable amount of terrain information through the feet. For example, surface discriminations can be made of concrete, gravel and grass. Rugs in specific rooms or even mats located at doors may also be considered as additional surface cues (Chapman, 1978).

To extend the reach of his/her touch senses, the visually impaired person may use a cane, which may provide him/her with information similar to that obtained through the feet, however at a minimum of one step in advance (Carroll, 1961; Lowenfeld, 1973). The use of the long cane also enables the visually impaired walker to detect objects as well as surface changes in his/her path which may alter his/her course.

Further orientation cues may be provided by thermal receptors found in the skin. For example, the warmth of the sun may aid the visually impaired individual's travel by verifying direction to ensure that it is on the right side of the face and body in order to travel further in the appropriate direction. Perception of warmth and coolness are additional cues which may assist the visually impaired's orientation (Chapman, 1978).

KINESTHESIS OR PROPRIOCEPTION

Kinesthesis, for the purpose of this study, can be defined as the sensitivity to muscular or joint motion (Lowenfeld, 1973). Receptors in the joints provide kinesthetic information about the position of limbs (Pick, 1980),

therefore making us cognizant of our body's position and movement. For instance, the ankle joint can provide one with valuable information concerning declines and lateral tilts in walking surfaces, which can be detected as the angle of the foot with the lower leg is altered from its usual position (Lowenfeld, 1973), thus aiding the visually impaired individual's orientation and mobility. The kinesthetic sense also makes us aware of our body's position and movement. When our arm is raised to shoulder height, the kinesthetic senses indicates it's position to us.

Muscle memory is another aspect of the kinesthetic sense which, according to Carroll (1961), is defined as the repetition of motor movements frequently enough and in a fixed sequence, so that they become automatic. For traveling short routes, about a room for example, this phenomenon may be very useful for the visually handicapped. By traveling repeatedly from one piece of furniture to another, the distance should become known automatically without having to count steps. Therefore when proceeding over the same route, the visually impaired individual may become more proficient, and begin to function as sighted people do when they approach tables, desks, kitchen counters, etc (Carroll, 1961).

OLFACTORY SENSE

The sense of smell conveys information concerning places, things and people and may be useful for the visually impaired individual in orientation and mobility (Lowenfeld, 1973). Places may be located by their characteristic smells. For example, the smell of bread will reveal bakeries, odors of food will reveal restaurants as the smell of oil and gasoline will reveal service stations (Chapman, 1978; Lowenfeld, 1973).

Visually impaired individuals who come to know and evaluate smells may identify individuals through their characteristic scent, which in most cases are the scents of perfume or tobacco which reveal their identity (Lowenfeld, 1973).

VISUALIZATION

According to Carroll (1961), many individuals who were previously sighted have memories of beautiful things which may be recalled and combined to create new pictures in the mind. However, if the visually impaired individual does not make use of this ability, the sense of visual form, shape and perspective, as well as the memory of color may be lost. In order for the visually impaired person to maintain an appreciation for visualization, objects must be brought to him/her through description, his/her other senses, or through the combination of description and sense intake (Carroll, 1961).

III VISUALLY IMPAIRED ATHLETES

It is common practice to overprotect blind individuals by excusing them from vigorous exercise (Buell, 1986). However, according to Buell (1986), physiologically there is no valid reason why visually impaired persons should not compete in athletic events at interscholastic, intercollegiate, national, and even international levels.

Although numerous blind individuals indicate that athletics and physical fitness is an important part of their lives, overprotection still remains as a major problem in the education of visually impaired individuals (Richardson et al., 1987; Sherrill et al., 1984).

According to Hanna (1986), the level of physical fitness of visually impaired individuals is significantly lower than that of their sighted peers. Although visually impaired students have recently been mainstreamed in school subject areas, effective participation in physical education is an area in which many problems still exist. A common problem is the visually impaired individuals' reluctance to exercise to avoid embarrassment, and his difficulty in overcoming the protective shell built around him by overprotective parents or others. The attitude and knowledge of the physical educator regarding visually impaired individuals is a great obstacle for the blind student to overcome (Hanna, 1986). Buell (1985), therefore suggests that the physical educator should create an environment in which the student is encouraged to try a series of activities. Positive reinforcement should also be provided on a regular basis, thus emphasizing what he or she can do as opposed to what he or she cannot do.

Effective mainstreaming may also be achieved by pairing the blind student with an aid or another willing classmate. The visually impaired individual can then be taught to feel a skill, to perform in slow motion, as well as how to run, jump, and hop by holding on to a designated classmate (Hanna, 1986).

Exercise in the lives of all individuals plays an important role in one's physical development. Research suggests that overprotective parents have se-

riously hampered the physical development of their visually impaired children (Hanna, 1986; Sherrill et al., 1986). There is a continual need to provide these individuals with the appropriate motor tasks in order to facilitate the development and understanding of body image, laterally and directionally (Hanna, 1986).

Due to recent research (Buell, 1986; Nixon II, 1988; Sherrill et al., 1984; Sherrill et al., 1986) which suggests that visually impaired athletes who compete in high level, national and international sport competition do not perceive their parents as the principal source of inspiration for their sports involvement, Nixon II (1988) examined parental encouragement, and the sports involvement of visually impaired children and youths. Parents of blind children were interviewed concerning their encouragement and discouragement of sports involvement for their child. Results indicated that visually impaired individuals involved in sport competition generally perceived other specializing agents such as teachers and friends as more important, and saw many of their parents as overprotective.

A study by Sherrill, Pope and Arnhold (1986), examined the sport socialization of blind athletes. The population selected for the study were 133 athletes from the U.S.A.B.A. games (United States Association for Blind Athletes). Athletes were interviewed during a five-day meet. Results indicated that, in general, visually impaired athletes were introduced to their favorite sports at a later age. A physical educator/coach initially introduced 41% of blind athletes to sport, the family did so for only 15%, self 1%, friends 8%, combination of factors 29% and other 6%.

Professionals working in the field of adapted physical education indicate the importance of providing visually impaired individuals with the opportunity to experience physical activity in order to help them realize their capabilities. Further benefits include learning teamwork by working with a sighted guide, becoming more independent from parents, learning goal setting which may carry over to other aspects of life, increasing motivation, perseverance and

trust, and being in contact with other visually impaired individuals who may serve as models of successful adjustment (Nixon II, 1988).

Mastro (1985) describes a continuum which he believes visually impaired athletes follow in order to become an elite athlete. These facets include permission, inclination, information, opportunity to participate, inspiration, dedication and frustration.

The first facet is permission. In order to allow an individual to grow as a self-confident, competent human being throughout life, permission to do so must be given to these individuals by their families as well as by society. Visually impaired individuals must be allowed to take risks in order to realize their capabilities. Thus, overprotective parents of a visually impaired individual may be of more harm than physical deprivation.

The second facet of the continuum is inclination, which states that because of the complexity of the disability, physical educators, administrators and coaches are often overwhelmed, and as a result, the teaching of physical fitness to visually impaired individuals is frequently ignored. However, with the recent passage of the Eudcation For All Handicapped Children Act, PL 94-192, all handicapped individuals are supposed to be given the opportunity to become aware of the physical demands and skills needed in various sports in order to become proficient in a desired event (Mastro, 1985).

Through the third facet, that of information obtained from parents, teachers and professionals, visually impaired athletes are made aware of the available opportunities to compete at the local, regional, national and international levels against other visually impaired athletes (Mastro, 1985).

The most important facet, after granting permission, is the opportunity to participate. However, visually impaired athletes are often limited to do so due to their dependencies upon the following factors; lack of sports skills, lack of adequate coaching and a lack of spontaneity due to the fact that a visually impaired athlete must depend on others for transportation, orientation

of facilities and equipment. However, through the adaptation of rules, the blind athlete is given the opportunity to participate in a variety of sports (Mastro, 1985).

When involved in high level competition, the visually impaired athlete may enter the fifth facet, inspiration. It is in this facet that the visually impaired athlete comes to the realization that athletics can be fun as well as beneficial. These benefits may be psychological, physiological or sociological (Mastro, 1985). In addition, athletics can help the individuals personal adjustment, leading way toward personal achievements and away from social withdrawal (Mastro, 1985).

In the facet of dedication, the visually impaired athlete, now given the opportunity to dedicate themselves to accomplishing goals in athletics, must be willing to devote time, emotion and pain in order to fulfill this purpose. Other forms of fun must also be sacrificed in order to compete in an athletic event of his or her own choosing.

Frustration, the final facet, is caused by feelings of discouragement and disappointment which can prevent the visually impaired athlete from achieving his or her goal. Disabled athletes are similar to non-disabled athletes as both experience feelings of anxiety, satisfaction of winning, and frustration in loosing. The only difference lies in the limitations imposed by the disability itself (Mastro, 1985).

According to Buell (1986), more visually impaired athletes are successfully competing in the mainstream against opponents with normal vision. In wrestling, each year, it is estimated that five thousand sighted wrestlers compete against opponents who are sightless on all levels (Buell, 1981; Buell, 1986). In these bouts, for many years, blind wrestlers have won more often than they have lost. James Mastro, possessing light perception vision only, wrestled in the 1976 finals to qualify for the Olympics despite a broken arm, and was selected as an alternate for the U.S. wrestling team. This is just one of the many examples of visually impaired wrestlers who have made their mark in sport.

Many swimmers with low vision have also distinguished themselves in water sports. Trischa Zorn, of California, was one of the top fifteen backstrokers in the U.S. In 1979 she qualified for both the indoor and outdoor National Junior Olympics. In 1984, at the Big 8 Conference swim meet she placed second in the 200 yd. backstroke, and was selected three times on the All-American high school team. She was also offered twelve full scholarships when graduating from high school.

Visually impaired athletes can also run assisted, or unassisted, with as little as three percent normal vision, and become competitive in distance running (Buell, 1986).

Further sports in which visually impaired athletes are actively competing include gymnastics, skating, tandem-cycling, climbing, sky diving, track and field, powerlifting and cross country skiing, to name but a few (Benison, 1983; Buel, 1981; Buel, 1986).

it has been clearly demonstrated that blind individuals can successfully participate in a variety of sports as well as against sighted opponents.

Because of their disability, visually impaired individuals are often denied the opportunity to experience life in the same manner as their sighted peers, for the fear that they will get hurt in the process. Although blind persons must depend upon others to fulfill some of their basic needs, over-protection is a major factor interfering with the visually impaired persons physical and mental development. As a result of physical deprivation, many blind people lack vigor, strength, have poor posture and develop "blindisms" such as rocking, twitching, and shaking the head as an outlet for the release of tension (hanna, 1986). Furthermore, physical deprivation may effect the visually impaired individuals self-concept by reinforcing feelings of inadequacy and dependency.

Because of the number of barriers which still exist today, blind athletes competing in high level competition are very few. Every athlete, sighted or

blind, requires support when attempting to reach specific goals. However, with little encouragement, visually impaired athletes will find this process frustrating and difficult.

Although blind athletes have and can accomplish great heights in athletic competition, hundreds of high school and colleges are still excusing blind students from physical education classes (Buel, 1986; Dye, 1980), while others discourage participation of blind students in school and community competition.

In light of what visually impaired athletes have achieved, it is evident that thousands of sightless individuals are being treated unfairly. It is hoped that in the future, with the education of the public (Ogilivie, 1985), that all blind individuals will acquire the right to compete in mainstream sports of their own choosing.

IV GOAL BALL

INTRODUCTION

Goal ball is a game devised for visually impaired individuals in which the young and old, male and female population can participate. It also encourages the use of one's strength, stamina and auditory tracking skills (McMahon, 1986). Goal ball also provides the visually impaired with an opportunity to compete in a team sport, thus giving them the sensation of what it is like to be "part of a group" (Kearney and Copeland, 1979). Furthermore, goal ball takes little equipment and enhances an individual's special awareness, orientation and coordination (Kearney and Copeland, 1980).

HISTORY

Goal ball was developed shortly after World War II in various European countries to serve an enormous number of amputees, spinal paralyzed and blind veterans requiring rehabilitation. Before the war, these men were abled human beings possessing the ability to compete in athletics. Following the war, various European governments were faced with the problem of rehabilitation. What could be done to rehabilitate these veterans who were left blind? (Kearney and Copeland, 1980).

The game originated in West Germany and Austria through the efforts of Hans Lorezen and Sepp Reindle, both veterans of World War II. Goal ball provided the visually impaired with the opportunity to use concentration, agility and endurance. An interest in life and thrill of competition could again be experienced by visually impaired individuals (Kearney and Copeland, 1980; Malpass, 1980).

Since its development in 1946, goal ball has grown into an international sport. It is now a part of the Olympics for the Physically Disabled and World Championships. Although Canadians have only been participating in goal ball since 1978, they are amongst the best players in the world (Newsletter, 1984).

SUMMARY

In its simplest form, goal ball played on a surface the size of a volleyball court, is a side of three players rolling a thick hollow rubber ball containing bells, across the court, past the three opposing players, and across the endline (Malpass, 1980; Newsletter, 1984).

All the action takes place on a rectangular area at each end of the court. All participants are required to wear blindfolds. Tape on the courts edges helps the players to orient themselves.

Offensively, the players have 15 seconds to put the ball into play by throwing it with a bowling motion. The defending players, in an attempt to block the ball with any part of their body, flop down upon the rectangular area (Newsletter, 1984).

For more information regarding equipment and rules for goal ball refer to Appendix A.

CHAPTER III

RESEARCH METHODS

This chapter discusses the methodology bo be followed in this study, beginning with an overview of the project design, followed by the method, which contains instrument development, subjects and data collection, design and data analysis.

I OVERVIEW OF THE PROJECT DESIGN

This study is exploratory in nature. It will attempt to examine the imagery procedures employed by visually impaired athletes for sport and for mobility outside of sport. Extensive interviews will be conducted with elite Canadian blind athletes who are currently competing in the sport of goal ball at a national level, in order to determine the type of imagery they use, the quality of their imagery, and the process by which they have learned and refined their imagery skills.

II METHOD

I INSTRUMENT DEVELOPMENT

For the purpose of this study the Visually Impaired Athlete Interview Guide was developed to elicit qualitative information concerning each athletes preparation procedures for competition and for general mobility, specifically with regard to imagery. This open-ended in-depth interview schedule consisting of a series of questions will investigate the visually impaired athletes background concerning the use of imagery and mental preparation for events, the specific feelings experienced by these athletes when using imagery, the distinct senses involved when playing and imagining themselves playing the sport of goal ball, as well as their views on learning and improved learning of "feeling" imagery skills. To familiarize the researcher with the process of interviewing blind athletes, as well as to establish face validity with respect to the

interview, a pilot study was conducted with three visually impaired goal ball players currently competing in the area.

II SUBJECTS AND DATA COLLECTION

Subjects to be interviewed for this study will consist of 25 top Canadian male and female visually impaired athletes, who are currently competing at a national level in the sport of goal ball, and who have been visually impaired for a minimum of fifty percent of their life.

Subjects will be selected from Canadian goal ball teams competing in a National Goal Ball tournament, January 27/89, in Ottawa. Due to the fact that all teams are comprised of both visually impaired and sighted athletes, an average of three visually impaired athletes per team will be chosen for the study. Prior to the tournament, all teams will be sent a personal letter explaining the purpose and significance of the study, assuring confidentiality, and alerting them to the fact that the researcher would be contacting he or she by phone in order to determine a convenient time and place for the interview.

Each interview will be tape-recorded, thus enabling the researcher to make a typed transcript for later review. Interviews will be controlled by the use of the Visually Iimpaired Athlete Interview Guide which is a structured interview, ensuring that all questions are dealt with in a standard way. Interview bias will also be controlled by having the researcher read the transcripts as well as having a second experienced researcher read the same transcripts to ensure reliable coding of responses. Lastly, edited transcripts for a limited number of subjects, will be transformed into brail and returned to the athlete for review, or copies of tapes will be sent to each subject also providing them with the opportunity for review, in order to ensure that all statements are accurate.

III DESIGN

The interview format was considered most appropriate for meeting the needs of this study for the following reasons:

1. "Interviews provide the opportunity for open searching and probing necessary to explore new topics.

2. Interviews enable the investigators to learn and understand the terms which athletes use to discuss mental preparation topics.

3. Interviews scheduled at the convenience of the athletes increase the likelihood that they will participate in the study" (Orlick and Partington, 1986).

According to Dalen (1973), because numerous individuals are more willing to communicate verbally than in writing, data will therefore be provided more easily and promptly in an interview than on a questionnaire.

The interview also has the advantage of being a flexible measurement device comprised of open-ended questions to which the athlete can offer a fairly free response (Wiersma, 1985). This is especially true for people who are blind.

Furthermore, the interview provides additional flexibility in that the interviewer can ask for an elaboration or a redefinition of an incomplete or ambiguous response. The response may also reveal matters such as factors or feelings that an interviewer may choose to pursue, that would not be touched on in a questionnaire. Additional information such as tone of voice, facial and bodily expressions often conveyed throughout an interview, provides the interviewer with further knowledge that would not be available in a questionnaire (Dalen, 1973; Wiersma, 1985).

Lastly, these auditory and visual cues also have the potential to help the interviewer decipher the tone of the conversation so as to gain knowledge

regarding the athletes motivations, feelings, attitudes, and beliefs (Dalen, 1973).

IV DATA ANALYSIS

The typed verbatim interview transcripts will be qualitatively analyzed. Each transcript will be read several times by the researcher as well as by an additional researcher experienced in the area of sport psychology in an attempt to independently identify common elements with in each transcript.

Following the content analysis, responses will be categorized and percentages of response per category will be presented.

APPENDIX A

EQUIPMENT

The only required equipment for the game of goal ball are blindfolds and a bell ball. An official two kilogram goal ball (approximately 4.50 lbs), is made of a mold rubber substance with a hallowed center containing several bells, and resembles a cross between a basketball and a medicine ball (Kearney and Copeland, 1979; Kearney et al., 1980; Malpass, 1980; McMahon, 1986). On it's surface the men's ball contains eight to ten small openings permitting the bell sound to escape. These small openings also aid in reducing bouncing, thus enabling the players to track it's direction more easily. The cover is three centimeters in thickness with an overall circumference of 86.36 centimeters (34 inches) (Kearney et al., 1979; Kearney et al., 1980). For women the goal ball is 1.5 kilograms in weight and 69 centimeters in circumference (McGrain et al., 1987). If you do not want permanent lines, a rectangular court can be placed on any floor, approximately the same size of a volleyballl court, with white two-inch tape. In the team area, the two one meter and two fifty meter lines are used by all players in orienting themselves to their positions. Facing in the direction of the opponent's goal, the players situate themselves behind their line (Guiterrez, 1983; Kearney et al, 1979, 1980; McMahon, 1986).

Depending on the seriousness of the sport, optional equipment may include head gear, face guard, knee pads, hip pads, elbow pads, and shin pads (Kearney et al., 1980).

RULES FOR GOAL BALL

Competitions in goal ball are based on sex and visual acuity. To participate, an athlete must be in one of three categories: Class A - participants are totally blind, possessing light perception with no visual acuity and/or possessing three degrees or less in visual field: Class b - those possessing hand movement, but with visual acuity of no better than 20/400 corrected and/or visual acuity from three to ten degrees: Class C - those with visual acuity

from 20/400 through 20/200 and/or visual field range of ten to twenty degrees (Dye, 1980; Malpass, 1980).

The basic rules of goal ball are as follows:

1. Each team consists of three players (one middle and two out), which are located in each team area, and two substitutes. Players and substitutes can be exchanged as often as wanted during half-time and time-out periods during play (Kearney et al, 1979; McMahon, 1986).

2. The game is played on the floor within a rectangular carpeted field area located at each end of the court. Tape on the carpet and edges helps the players to orient themselves (Kearney et al., 1979; Newsletter, 1984).

3. All players are blindfolded, including those who are totally blind, in order to eliminate any advantages of partially signted players (Malpass, 1980).

4. All spectators must be quiet at all times, with the exceptions of immediately following a score and/or defensive play (Malpass, 1980).

5. The goal ball is rolled by each team to the opposite goal line, while the other team, now on defense, tries to stop it.

Before the beginning of the game, each team captain chooses service or end of court by a coin flip. The goal ball game is divided into two seven-minute halves with teams switching sides and service at half time. In the case of a tie, with a new coin flip to decide team service and side, time is extended to two three-minute periods following regulation time (Kearney et al., 1979; McGrain et al., 1987; McMahon, 1986).

7. All three players have a fixed defense position. Two wings located behind and to either side of the remaining player, called the center. Each

player can make full use of the team area when throwing the ball (Kearney et al, 1980; McMahon, 1986).

8. All players can throw the ball but no more than three consecutive times by the same player. Throws can only be made from the team area. If the player throwing the ball surpasses the front limitation line or the team area with is/her foot, if the same player throws the ball four times in a row, and if the ball surpasses the overthrow line, the throw becomes invalid, and will be given to the opposing team (Kearney et al., 1979).

9. Defense is formed by the entire team and it's objective is to use one's body in a standing, squatting or kneeling position to block the oncoming ball before it crosses the back line. In an attempt to block the ball, the player may use his-her entire body by moving left or right, or stretching out horizontally on the floor (McMahon, 1986).

10. After blocking the ball and obtaining it's control, a player has up to ten seconds in which to make an offensive throw (McMahon, 1986). A player may also pass the ball to either one of his-her teammates who then can make an offensive throw.

11. When the ball surpasses the goal line, a goal is declared.

12. Any player on the team can execute the penalty throw. The player who has caused the penalty throw has to leave the penalty area while the throw is being executed (Kearney et al., 1979). The two remaining players defend against the throw. The third player may return to the field once the penalty throw is executed.

Because goal ball is a strenuous and demanding sport, it is therefore important for each team to practice various strategies which may be used effectively throughout play. For example, in the second half, if a team is leading, the game can be slowed down by using a quiet ball, one that will roll down the court slowly. Another tactic may be rattling and shaking the ball

before it is delivered in order to confuse the opponent. Lastly, side and cross court throws may also be used when trying to score (Newsletter, 1984).

Goal ball, as any sport, requires long hours of training. Such skills as tracking, throwing and passing the ball, orientation skills as well as defensive positions, must be combined in a team effort. Due to the fact that few visually impaired individuals have ever had the opportunity to compete in a team sport, long hours of practice become necessary in acquiring the appropriate skills (Dye, 1980; Kearney et al, 1980).